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General Information 1958-1959

BULLETIN OF THE
UNIVERSITY OF
NEW HAMPSHIRE

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General Information

An Issue

of the

Bulletin of the

University of New Hampshire

VOL. XLVIV DECEMBER 1957 NO. 3

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University Calendar

First Semester

1958

Sept. 19	Friday	First Faculty meeting
Sept. 19	Friday, 9 a.m. to 4 p.m.	Registration for re-admissions, transfers, and graduate students
Sept. 22-24	Monday to Wednesday	Orientation
Sept. 25	Thursday	Classes start, 8:00 a.m.
Oct. 18	Saturday	Homecoming
Oct. 24	Friday	High School-University Day
Nov. 1	Saturday	Dad's Day
Nov. 17	Monday	Mid-semester reports to be filed, 9:00 a.m.
Nov. 26	Wednesday	Thanksgiving recess starts, 12:30 p.m.
Dec. 1	Monday	Classes resume, 8:00 a.m.
Dec. 20	Saturday	Christmas recess starts, 12:30 p.m.

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Jan. 5	Monday	Classes resume, 8:00 a.m.
Jan. 20-22	Tuesday to Thursday	Drop and Adds for Second Semester accepted
Jan. 26	Monday	Examinations start
Feb. 3	Tuesday	Examinations end

Second Semester

Feb. 9	Monday	Classes start, 8:00 a.m.
Mar. 28	Saturday	Mid-semester reports to be filed, 9 a.m.
Mar. 28	Saturday	Spring recess starts, 12:30 p.m.
April 6	Monday	Classes resume, 8:00 a.m.
May 2	Saturday	Mother's Day, classes end at 11:00 a.m.
May 5 May 19	Tuesday to Tuesday	Pre-registration period
May 30	Saturday	Memorial Day — holiday
June 1	Monday	Examinations start
June 9	Tuesday	Examinations end
June 14	Sunday	Commencement
June 19	Friday	Alumni Weekend begins

General Information about the University of New Hampshire

Its History

FOUNDED IN 1866, the University of New Hampshire is one of the nation's land-grant colleges which were established by the Federal Morrill Act. The University had its beginning as a College of Agriculture and Mechanic Arts as a part of Dartmouth College in Hanover.

In 1892 the College was moved to its present site in Durham, to take advantage of the bequest of the estate of Benjamin Thompson, a prosperous farmer. He gave his land and money to the State on condition that an agricultural college be established on his Durham farm. Although the will was made in 1856, its terms were not disclosed until 1890, and by the time the estate became available in 1910, the gift in land and securities had grown from $300,000 to about $800,000.

Meanwhile, the State Legislature in 1890 took legal steps to establish the College at Durham, and in 1892 the Senior class enthusiastically held its commencement exercises in the first building which had been completed — a cow barn. Four other buildings were ready for use in 1893 by a group of 64 students, including four women.

Steady growth since that time has resulted in an educational institution recognized as one of America's great state universities, with an enrollment of 3,350 students and a physical plant of nearly 50 classroom and laboratory buildings and dormitories. In 1923 the State Legislature renamed the institution "The University of New Hampshire", creating within it the College of Agriculture, Liberal Arts, and Technology.

Two years later permanent support for the University was provided by the Legislature in its enactment of legislation granting an annual income of one mill for each dollar of the assessed valuation of all taxable property in the State. Since then the mill tax legislation has been amended so that State support of the University amounts to about $2,380,000 annually.

Its Organization

The University is governed by a 13-member Board of Trustees. The Governor of the State, the Commissioner of Agriculture, and the President of the University are members *ex officiis;* eight members are appointed by the Governor; and two are elected by alumni.

Legislative jurisdiction in matters of student government and educational policy is held by the University Senate, a representative body of members of the Faculty. Within the Senate is the Faculty Council which acts in an advisory capacity to the President of the University.

Its Programs of Instruction

Resident instruction is offered in the College of Agriculture. the College of Liberal Arts, the College of Technology, the Graduate School, the Summer Session, the Departments of Physical Education for Men and for Women, the Division of Reserve Officer Training, and the Thompson School of Agriculture. Detailed explanation of the instruction offered will be found starting on Page 31.

The University confers the following degrees:

College of Agriculture — Bachelor of Science in Agriculture, in Agricultural Engineering, in Forestry, and in Home Economics. In the Thompson School of Agriculture, a Certificate of Graduation.

College of Liberal Arts — Bachelor of Arts and Bachelor of Science

College of Technology — Professional degrees of Mechanical Engineer, Civil Engineer, and Electrical Engineer; Bachelor of Science in Chemistry, in Chemical Engineering, in Civil Engineering, in Electrical Engineering, in Mathematics, in Mechanical Engineering, and in Physics.

Graduate School — Master of Arts, Master of Education, Master of Science, Master of Science in Engineering, Master of Agricultural Education, Master of Science in Forestry, Doctor of Philosophy.

Its Land and Buildings

University lands comprise approximately 2,300 acres. Lands at Durham total about 1,500 acres, of which the campus proper and athletic fields make up 170 acres. The remainder are in forest, orchards and gardens, hay and pasture, and ponds.

There are 25 buildings devoted to administration. instruction, and research, 17 dormitories for men and women students, an extensive farm system, and two buildings and several playing fields devoted to physical education and athletics for men and women. The buildings are described in the center section of this bulletin as a legend for the map of the campus.

Its Services to the State

In addition to its regular program of instruction, the University conducts an active program for the benefit of the people of the

Musical activities provide cultural opportunities for the whole campus.

State in related fields of higher education, such as extension work and research.

The Cooperative Extension Service, with a staff of more than 70, operates in conjunction with the U. S. Department of Agriculture to disseminate information by means of demonstrations, meetings, the press, radio, and individual contacts. The Extension Service bridges the gap between the research done on the campus and the people of the State on their farms, in their homes, and in their communities.

The University Extension Service conducts an adult education program anywhere in the State where there is a demand, making available instruction on a college level. It takes its classes into industrial plants for a specialized technological instruction or it will conduct classes in cultural subjects in liberal arts. In addition this Service arranges for campus conferences and meetings of State and national groups, and it operates a library of educational films.

Research at the University is a continuing process in varied fields. The work is coordinated through the Council for Sponsored Research. Some research is conducted on an individual basis, that is, the specialist is under contract to an industrial firm or a government agency to do a specific project. But most of the work is carried on by three research units.

The Agricultural Experiment Station is concerned with solving the more important agricultural problems in an attempt to better rural life by bringing science to agriculture. Bulletins covering results of research are available for free distribution.

The Engineering Experiment Station provides engineering research facilities for the industries of the State and the State government. Although it does some independent research, much of its work is done in response to specific requests for technical assistance.

The Public Administration Service provides research facilities for government agencies of New Hampshire through the Department of Government, with assistance from other departments in the College of Liberal Arts.

Its Cultural Opportunities

As important as the classrooms and laboratories may be, a great University would be incomplete without cultural activities outside the regular program of instruction. The University conducts a number of cultural functions, both for the benefit of students and faculty and for the people of the State.

The center of the University's cultural life is the Library where there are nearly 240,000 books and a collection of more than 2,200 phonograph records. The Library has a branch for plant and animal sciences in Nesmith Hall and one for chemistry in James Hall, and an engineering reading room in Kingsbury Hall. The Library is a U. S. Government Depository Library. Beginning in 1958, the Library will be housed in a new $1,400,000 building.

The University has several collections housed in various buildings. They include one which illustrates the zoology, geology, entomology, and Americana of New Hampshire; one devoted to more than 500 costumes dating from Revolutionary times; another to fabrics; an extensive china and glass collection; a bird collection; and one devoted to testing machinery used by a New Hampshire professor more than 50 years ago when he developed what is known as the Kingsbury thrust bearing.

An outstanding cultural program in music includes a number of concerts by student vocal and instrumental groups and recitals by several talented faculty members. In this same field the University sponsors a special concert series each year which brings professional musicians to the campus from the nation's opera and symphony halls. A 64-bell electronic carillon plays daily concerts from the tower of Thompson Hall. The carillon, installed in 1952, is a memorial to the late registrar, Oren V. Henderson.

Drama is offered several times during the year by a capable student group, and there are many public lectures, both by faculty and off-campus speakers.

Through its Department of The Arts, the University displays a constant succession of loan exhibitions selected to appeal to a variety of interests. Some of these exhibits are shown in the Art Division of the Library; others in the Exhibition Corridor at Hewitt Hall.

Student Life on Campus

Student Personnel Services

University responsibilities for student activities and welfare outside the formal academic organization are coordinated through the Division of Student Personnel. The activities in this area include supervision of student health. counseling. living arrangements, employment service, scholarships and loans. maintenance of academic standards, and protection of personel standards of conduct.

A student is held responsible for such rules and regulations as may be published in the *Rules Book for Students,* and he also must meet such new regulations as may be adopted subsequently by the University and made applicable to him.

The following administrative officers are concerned with the operation of the Division of Student Personnel:

Everett B. Sackett, *Dean of Students;* Margaret McKoane and Robb G. Gardiner, *Associate Deans of Students;* Charles H. Howarth, M.D., *University Physician;* Leighton A. Sanders, M.D., *Assistant University Physician;* Doris Beane, *University Recorder;* Harry R. Carroll, *Director of Admissions;* Peter Janetos, *Director of Placement;* Paul H. McIntire, *Director of Counseling;* Frederick M. Jervis, *Psychologist;* Kathleen Beckingham and Robert G. Congdon, *Counselors;* Herbert A. Carroll, *Consulting Clinical Psychologist;* Gerhard S. Nothmann, M.D., *Consulting Psychiatrist;* Staton R. Curtis, *Director of Student Union;* Robert L. Sherman, *Financial Aids Officer;* Harriet B. Nason, *Supervising Nurse.*

Dean of Students

The Dean of Students coordinates the work of the student personnel officers with each other and with the other departments of the University. He is chairman of several administrative committees, including the committee which enforces the scholastic standing rules.

Associate Deans of Students

The two Associate Deans of Students work with the Dean of Students in the supervision of activities of all students at the University. In the office of the Associate Deans the plans for all social occasions requiring chaperonage are reviewed. The Associate Deans are responsible for administering rules established by the University Senate and its subsidiary organizations.

The Associate Deans work closely with the other personnel agencies on campus, with the various colleges of the University, and with the residence halls and fraternities and sororities in order to allow each student to take fullest advantage of his college experience. Students having questions about any phase of college life are encouraged to discuss them with one of the Associate Deans.

Admissions Office

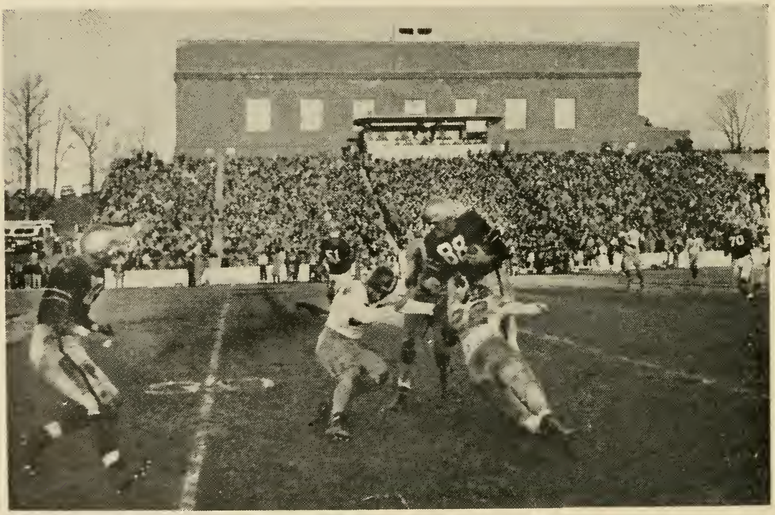
The function of the Admissions Office is to contact prospective college students, to process their applications, to correspond with them, to distribute bulletins and catalogues, and, finally, to select students. The Admissions Office is located in Thompson Hall.

School Testing Service

The School Testing Service is in the Counseling Service. Its chief function is to furnish the schools of the State the benefits of the University's trained personnel and testing facilities. The Service offers such programs as the High-School Survey, the Cooperative Guidance Program, as well as rental, scoring, consulting, and other professional technical services to the public schools of New Hampshire. Other programs are arranged to meet the needs of the schools.

Recorder's Office

The Recorder's Office conducts registration, maintains the academic records, issues grades and transcripts, checks the students' records and advises them of their progress toward graduation, makes up the student directory, Commencement lists, and honor rolls, and compiles other statistical data. It is closely allied with the Admissions Office. Veteran's routine contacts with the Veterans' Administration regarding educational benefits are handled through this office.



A New Hampshire end gains ground before a Cowell Stadium crowd.

Hi-U Day is an occasion for high-school students to visit the campus.

Counseling Service

The Counseling Service, without cost, assists students in discovering vocational abilities and aptitudes, in self-evaluation, and in the development of sound plans and objectives. It furnishes students with occupational and educational information as to requirements and opportunities. Personal counsel and guidance are offered to those students facing problems of emotional and social adjustment. It is the University's official testing agency charged with the administration of large-scale testing programs such as the Graduate Record Examination, the Orientation program, and others of a similar nature.

An Orientation program was instituted at the University in 1924. Its purpose is to introduce new students to the University, its history and its traditions, and to help them to adjust rapidly and effectively to college life. During this period new students accomplish their program planning and registration and get to know faculty and fellow students. Because of the proved importance of Orientation activities, all new students are required to be in attendance.

Health Service

The University Health Service, located in Hood House, is devoted to the protection, improvement, and maintenance of student health. A well-equipped out-patient clinic for diagnosis and treatment of ambulatory patients and a modern hospital of 26 beds, with private and semi-private rooms, wards, and an isolation division for communicable diseases, are constantly available for students who require medical or surgical care. Registered nurses are on duty at all times. Individual health guidance is given through personal conferences with the University physicians.

Payment of tuition entitles students to all medical care rendered by the University Physician and his staff. Injury and illness which require hospital confinement other than in Hood House, services of specialists, operations, ambulance service, special nurse, or special prescriptions are at the expense of the student. Bed patients at Hood House are charged $2.00 per day. Office hours of the University Physician are from 8:00 A.M. to 4:30 P.M. daily except Saturdays and Sundays.

Students' Medical Reimbursement Insurance

In addition to the health service available through Hood House, group accident and sickness insurance giving 12 months' coverage is available to students at the University. This insurance coverage is designed to supplement the program of the University. Complete details will be sent each student with his first semester bill.

Memorial Union

The University's new Memorial Union building, which began operations in the fall of 1957, has become a "community center" for students and faculty in the very broadest sense. The Memorial Union was especially designed to fulfill three worthy functions on the UNH campus: a living memorial to the men and women of the State of New Hampshire who have served in our armed forces, a college union, and a state-wide conference center. With its extensive and well-planned facilities, it serves as a focal point of all extra-curricular activities on the campus.

In addition to its meeting and conference rooms, lounges, music listening and TV rooms, cafeteria, snack bar, games area for table tennis, billiards, and bowling, and its spacious Strafford Room utilized for a variety of social functions, the Union provides permanent headquarters for several major student organizations.

The facilities of the Memorial Union are effectively adapted to the recreational needs of the campus by a well-rounded, leisure-time program of social and cultural activities planned by the various student committees of Student Union.

Religious Activities

Opportunities are provided in Durham for students to practice religion and to participate in religious life. The Hillel Foundation, the Newman Club, the Christian Science Organization, the Phanarion Society, and the United Protestant Association, which includes Cant-

The new Memorial Union was put into operation in the fall of 1957.

erbury Club, Christian Association, Channing-Murray Club, and Inter-Varsity Christian Fellowship, are the agencies through which the religious interests and life are fostered among the students.

The Durham Community Church welcomes students to its Sunday service of worship, and to share church activities through student affiliate membership.

The Student Church, under the sponsorship of the Minister to Protestant students, opens its doors to all students. Its services are held in Murkland Auditorium on Sunday mornings at 11:00 A.M.

The needs of Episcopal students are met by a chaplain who is also rector of St. George's Church. Services are held on Sundays at 8:00, 9:00, and 11:00 A.M. and 6:00 P.M.

The parish of St. Thomas More serves Roman Catholic members of the community. Sunday Masses are held at 8:00, 10:00, and 11:30 a.m.

Financial Aids Office

The Financial Aids office assists students in solving their financial problems. It processes applications for student loans, scholarships, and deferred tuition payments. Assistance also is given students in finding part-time employment during the college year and full-time employment during the summer vacations.

Placement Bureau

The Placement Bureau assists seniors, graduate students, and alumni to secure positions after graduation. It corresponds with, and interviews, school superintendents, personnel managers of industrial concerns, and others who employ baccalaureate and advanced degree students, calling to their attention seniors, graduate students, and alumni who are seeking positions.

Military Service Affairs

An Associate Dean of Students has been designated as the Administrator of Military Service Affairs for the University. In this capacity, he is the representative of the University in all matters concerning the Selective Service System and the branches of the Armed Forces. The Administrator acts in an advisory capacity to all students who have questions concerning military service. Students reaching their eighteenth birthday may complete the registration for Selective Service in his office.

Student Government

All undergraduate students are members of the "Student Government of the University of New Hampshire". The purposes of Student Government include promoting individual and collective responsibility among students, coordinating the activities of the student body and the faculty, and acting as the official representative body for the students. The work of the Student Government is carried on by the Student Senate, the members of which are elected to represent all housing units and the commuting students.

Subsidiary organizations include, in addition to the class organizations, Women's Inter-Dormitory Council, Men's Inter-Dormitory Council, Pan-Hellenic, and Inter-Fraternity Council. These organizations deal with matters of particular interest to their membership.

Associated Student Organizations

This activity provides a central administration of business affairs for member organizations. A board of three faculty members and five students approves budgets of member organizations, recommends the amount of the Student Activities' assessment and sets standards for, and supervises the financial activities of, member organizations.

Student Organizations

Special Interest Organizations

There are about forty recognized student organizations for those interested in some special field, such as chemistry or sociology, or an activity, such as skiing and hiking, dramatics, radio, etc. In addition there are nine musical organizations.

National Honorary Societies

ALPHA EPSILON DELTA, Pre-Medical
ALPHA KAPPA DELTA, Sociology
ALPHA ZETA, Agriculture
ARNOLD AIR SOCIETY, Harl Pease Jr. Squadron, Military
PHI BETA KAPPA, New Hampshire Beta Chapter
PHI KAPPA PHI, Highest-ranking Seniors selected from all Colleges
PHI SIGMA, Biology
PHI UPSILON OMICRON, Home Economics
PI GAMMA MU, Social Science

Pi Mu Epsilon, Mathematics
Pi Sigma Alpha, Government
Psi Chi, Psychology
Scabbard and Blade, Company F. Sixth Regiment, Military
Sigma Pi Sigma, Physics
Tau Beta Pi Association, Engineering
Tau Kappa Alpha, Debate and Oratory

Social Honorary Societies

Blue Key, Senior men
Mortar Board, Senior women
Senior Skulls, Senior men

Student Publications

The Granite is an illustrated annual published by the Senior Class.

The New Hampshire, weekly newspaper, presents campus news.

Religious Organizations

The Canterbury Club is an association of the Episcopal students on campus.

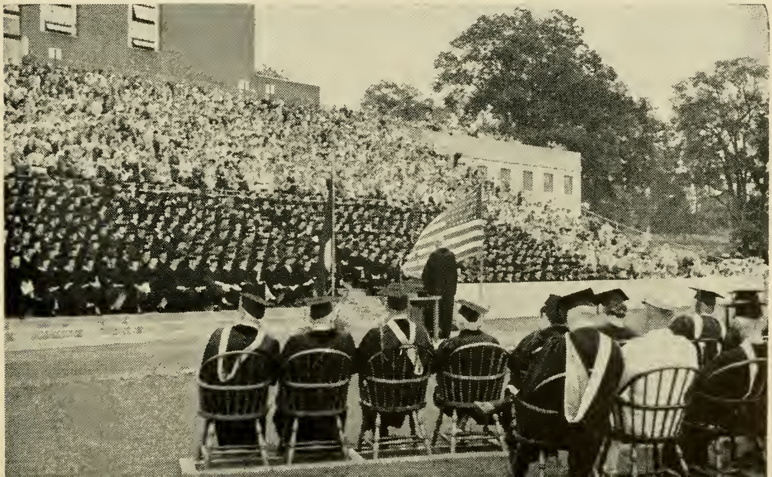
The Channing-Murray Club fosters the religious activities of Unitarian and Universalist students.

The Inter-Varsity Fellowship is an organization to promote Christian fellowship, Bible study, and prayer.

A Christian Science organization welcomes all who are interested to its weekly testimonial services.

The Hillel Society is an organization to bring to Jewish students a more adequate knowledge of their heritage, and to foster

The commencement program in June customarily fills Cowell Stadium.



friendship, cooperation, and understanding among the various religious groups. Activities include religious services, holiday observances, discussion groups, and the maintenance of a library relative to Jewish study which is open to all students.

THE NEWMAN CLUB, an organization of Catholic culture and fellowship, fosters the spiritual, intellectual, and social interests of Catholic students. It is a member of the Newman Club Federation. Activities include corporate communions, discussion study groups, lectures, dramatics, parties, dances, etc. A Reading Room is provided in New Hampshire Hall.

PHANARION SOCIETY, for students of the Greek Orthodox Church.

THE UNH CHRISTIAN ASSOCIATION is an organization to provide a Protestant chaplain and to maintain an adequate program of activities for the developing of Christian life in the students of Protestant affiliation of the University and to cooperate in the inter-faith religious work of the campus. It is sponsored by the United Protestant Association, the Board of Directors of which is composed of representatives of Protestant churches in the State, parents of students, alumni, faculty, and students of the University, and the State YMCA and YWCA.

THE UNIVERSITY RELIGIOUS COUNCIL represents the cooperative work of the several religious organizations on campus. Its projects include Religious Emphasis Week.

Fraternities and Sororities

FRATERNITIES* — Kappa Sigma, (1894) 1901; Sigma Alpha Epsilon, (1894) 1917; Theta Chi, (1903) 1910; Lambda Chi Alpha, (1906) 1918; Alpha Tau Omega, (1907) 1917; Phi Mu Delta, (1914) 1918; Phi Kappa Alpha, (1921) 1929; Sigma Beta, (1912); Phi Alpha, (1922) 1924; Theta Kappa Phi, (1922) 1923; Alpha Gamma Rho, (1923) 1924; Phi Delta Upsilon, (1924); Tau Kappa Epsilon, (1925) 1932; Acacia, (1949) 1949.

SORORITIES* — Chi Omega, (1897) 1915; Alpha Chi Omega, (1913) 1924; Alpha Xi Delta, (1913) 1914; Phi Mu, (1916) 1919; Kappa Delta, (1919) 1929; Theta Upsilon, (1926) 1930.

The Alumni Association

Upon leaving New Hampshire, students automatically become members of the Alumni Association. Reunions in June, Homecoming in fall, alumni clubs throughout the country, and a monthly magazine keep alumni up to date with University activities.

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* The year in parenthesis is the date of founding as a local; the other year is the date the local joined a national fraternity.

Methods of Admission

Regular Students

The University will admit without examination properly prepared New Hampshire students who are graduates of high schools or academies of New Hampshire which are approved by the State Board of Education. or those who are graduates of other accredited preparatory schools.

In-state applicants must have a scholastic record ranking in the upper two-fifths of the graduating class in order to be eligible for admission without examination.

The number of out-of-state students admitted each year is limited by law to a small proportion of the entering class. Selection of out-of-state candidates is made primarily on the basis of superior academic achievement in secondary school, but such traits as character, leadership, and initiative will be taken into account. Out-of-state applicants are expected to submit the results of the College Board Scholastic Aptitude Test. Under an agreement by the six New England State Universities, after qualified residents of New Hampshire are accommodated in the Hotel Administration and Occupational Therapy curriculums, residents of other New England states will be given priority over those from other regions.

Because of the large number of New Hampshire students needing financial assistance, out-of-state applicants will be expected to give evidence of reasonable financial backing.

Applicants for admission are required to fill out an application form prepared by the University. Copies of this form may be obtained from secondary-school officials in New Hampshire or from the Director of Admissions.

An applicant for admission who is a resident of New Hampshire is required to remit a tuition deposit of $15 with his application. One from outside the State is required to remit $40. If the applicant is admitted to the University, his advance payment will be applied to the first semester's tuition: if he is not admitted, his advance payment will be returned. In the case of the applicant who is accepted for admission but does not enter or who withdraws after being accepted, the advance payment will not be returned. Remittance should be made either by check or by money order payable directly to the University of New Hampshire and should be sent with the application for admission.

Applications for admission in September should not be made until a student has received grades for the first ranking period of the senior year in high school. To insure consideration before the out-

Commons houses the freshman dining hall and an upperclass cafeteria.

of-state quota is filled, out-of-state students should file applications not later than the middle of March. To insure eligibility for financial aid and a choice of dormitory rooms, in-state students should apply during the spring. It is understood that the preparatory work of students applying during the spring will be completed successfully by the end of the school year. *No application will be considered which is not complete one week before the start of Orientation Week.*

Candidates for admission to the freshman class must show evidence that they are prepared in 15 units.

An entrance unit represents one course of four or five recitations a week for one year. It is assumed that two hours of shop or laboratory work are equivalent to one hour of classroom work.

Of the fifteen units required, each applicant for admission into the freshman class must present at least twelve units in college preparatory subjects, including at least three units of English, one unit of natural science, and one in social studies.

In addition, students entering the *College of Agriculture* will be required to present two units of college-preparatory mathematics.

Students entering the *College of Liberal Arts* will be required to present two units of either a single foreign language or of college-preparatory mathematics. It is strongly recommended that candidates present two units of mathematics as well as two units of a foreign language.

Students enrolling in the *College of Technology* or electing agricultural engineering must offer at least three and one-half units of mathematics, including elementary and intermediate algebra, plane geometry, and trigonometry. Commercial arithmetic and shop mathematics are not classified as college-preparatory subjects.

Cases not covered by the above statements will be decided by the Committee on Admission.

Every candidate for admission claiming New Hampshire residence shall be required to complete a form which contains a statement to the effect that his parents are legally domiciled in the State of New Hampshire and that their names have appeared on the check list of the town or city of domicile for the entire past year. This statement must be notarized before an official authorized to administer oaths. Students admitted from foreign countries or states other than New Hampshire shall be deemed to be non-resident students throughout their entire attendance at the University unless and until the parents shall have gained *bona fide* residence in New Hampshire.

Students admitted to the University must present to the Director of the University Health Service completed medical history and physical examination reports before registration can be completed. The forms for this report are furnished by the University.*

Special Students

This category is reserved for adults who have a definite objective which can be accomplished by taking one or two courses for a semester or two.

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* Exemption from the requirements may be secured only through submission of a written statement from parent or guardian which indicates that the request is made because of religious beliefs.

Freshman Camp is sponsored by the various campus religious groups.

A person who has not been formally admitted as a candidate for a degree at the University, upon presenting evidence of his ability to carry successfully the desired courses, may be admitted as a special student. He may be required to demonstrate by examination or otherwise that he is qualified to undertake college work. Recent failure to maintain good academic standing in any college or university would be evidence of his inability to carry the work successfully.

In choosing his studies, the special student must have the approval each semester of the chairman of each department in which he elects courses and of the dean of the college in which he is taking a majority of his credits.

If a special student meets the usual requirements for admission as a candidate for a degree, he may, at the beginning of any semester by making the proper application, change from a "special" to a "regular" student status. A special student, who does not meet the usual admission requirements of the University, may be admitted as a regular student on the basis of completion of at least 26 semester hours of work with a minimum grade point average of 1.6 in all work taken as a special student. Such a special student must make the change at the beginning of the semester following the completion of the required 26 semester hours. Work taken as a special student shall count toward a degree, if the student later becomes classified as a regular student.

Advanced Standing

Qualified candidates for advanced standing from approved institutions may be admitted. Their status will be tentatively determined by the quantity and quality of the work completed at the institution from which they come. These credits are not made part of the permanent record until the student has completed at least one semester at the University of New Hampshire with a certain average. No transfer credit will be given for courses in which the student received the lowest passing grade.

(1) Such students must file the same application for admission as required of freshmen. In addition, they must furnish, at least 30 days prior to the time of transfer to the University of New Hampshire, an official transcript of work done at institutions previously attended.

(2) All candidates for the Bachelor's degree, admitted to advanced standing, must spend their last year in residence, either in course or in Summer Session. This requires the completion of at least a quarter of the credits required for the degree.

(3) Regardless of the amount of advanced standing a student may secure, in no case shall he be granted a Bachelor's degree until he has satisfied the full requirements of the curriculum he may elect.

Expenses at New Hampshire

Tuition

The tuition fee is $300 per year for residents of New Hampshire and $600 for non-residents. This charge is all-inclusive, covering registration, laboratory, health, graduation fees, and admission to all intercollegiate athletic events. However, refundable deposits may be required to cover loss or breakage in certain departments. A charge is made for individual lessons in music. In a few courses there is a charge for materials used in making articles kept by the student. Details will be found in the description of courses.

Any student registering for 8 credits or more per semester shall pay the full tuition. Any student registering for less than 8 credits shall pay $12.00 per credit hour.

Explanation of Expenses

Tuition — Tuition for each semester is payable in advance. Students who find it difficult or impossible to procure the necessary funds for the full amount due for a semester may make arrangements acceptable to the Treasurer for a series of payments during a semester.

If a student withdraws from the University his tuition will be refunded as follows: if withdrawal is within four days following his registration, three-fourths refund; after four days and within thirty, one-half refund; after thirty days, no refund.

Changes in Rates — The University reserves the right to adjust charges for such items as tuition, board, and room rent from time to time. Such changes will be held to a minimum and will be announced as far in advance as feasible.

Advance Tuition Payment — An applicant for admission who is a resident of New Hampshire is required to remit $15 with his application; one from outside the State is required to remit $40. If the applicant is admitted to the University, his advance payment will be applied to the first semester's tuition; if he is not admitted, his advance payment will be returned. The advance payment of a student who is admitted, but does not enter, will not be returned.

Military Deposit — Uniforms for members of the Reserve Officers Training Corps are provided in cooperation with the Federal Government. A deposit of $15 is required of each student to whom military equipment is issued and is refundable, minus cost of lost or damaged articles, at the time of returning military equipment.

Estimate of Freshman Expenses for a Year*

	High	*Average*	*Low*
Room (Dormitories)	$240	$200	$145
Board (at Commons)	310	310	310
Tuition	300(600)	300(600)	300(600)
Books	100	75	70
Laundry	40	25	15
Incidentals†	210	90	60
Total	$1200(1500)	$1000(1300)	$900(1200)

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* Figures in parenthesis are for non-residents of New Hampshire.

†This includes the Student Activity Tax. Expenses for travel, clothing, etc., vary with the individual student, and should be added.

ATHLETIC LOCKER DEPOSIT — Every student participating in the programs of Physical Education and Athletics for Men and Physical Education for Women is required to deposit $1.00 for a locker. This will be refunded upon return of the lock to the equipment room, minus 25 cents per semester, to meet partially the expense of towel service.

STUDENT ACTIVITY TAX — The Student Activity Tax, authorized by vote of the Student Senate with the approval of the Board of Trustees, must be paid by each undergraduate at the time of registration. The revenue from the tax provides each student with *The New Hampshire,* student newspaper; *The Granite,* University annual: Student Union membership, Student Government membership, and class activities. In 1958-59 this tax will be about $22.

BOOKS — Students may purchase books, classroom supplies, and other supplies at the University Bookstore in Thompson Hall.

ROOMS — The University has seven dormitories for women and nine for men. All rooms are heated, lighted, and furnished. Bed linen, blankets, and towels, however, are provided by the individual student. Automatic washing machines and driers are furnished for all residence halls. A service room is provided in each dormitory where University grills and irons may be used with safety. Applications for rooms should be addressed to Manager, University Housing, Thompson Hall.

Students living in University dormitories are required to sign room contracts covering the college year.

A ten-dollar ($10.00) room deposit must accompany each application, this deposit to be forfeited if the room accepted is not occupied by the applicant. The deposit is held as a guarantee against damage and will be returned at the close of the year or upon the student's withdrawal.

(Continued on Page 27)

Campus Map Legend

(The map will be found on the next two pages.)

UNIVERSITY BUILDINGS

1 Hetzel Hall, men's dormitory

2 Fairchild Hall, men's dormitory

3 Commons, dining hall and University Extension Service

4 Alexander Hall, men's dormitory

5 East and West Halls, men's dormitories

6 Engelhardt Hall, men's dormitory

7 Hunter Hall, men's dormitory

8 Gibbs Hall, men's dormitory

9 College Road Apartments, quarters for married students

10 Memorial Union, student union and state conference center

11 Hood House, an out-patient clinic and infirmary for students

12 Hamilton Smith Library (will be vacated in summer of 1958 when University Library is completed)

13 Thompson Hall, offices of administration, Bookstore, and Cooperative Extension Service

14 University Library

15 Murkland Hall, main building of the College of Liberal Arts; includes a 360-seat auditorium with an organ

16 Conant Hall, geology, geography, psychology, and hotel administration departments in Liberal Arts

17 DeMeritt Hall, history and sociology in Liberal Arts; mathematics and physics in Technology

18 Morrill Hall, headquarters of the College of Agriculture; government and economics in Liberal Arts

19 James Hall, chemistry in Technology; agricultural and biological chemistry in Agriculture

20 Hewitt Hall, art, photography, and occupational therapy in Liberal Arts; audio-visual center; printing department

21 Forestry Building, forestry in Agriculture

22 Kingsbury Hall, main building of the College of Technology; departments of chemical, civil, electrical, and mechanical engineering; Engineering Experiment Station

23 Poultry Plant, seven buildings devoted to research and instruction

24 Service Buildings, maintenance shops and garages, storage rooms, and fire station

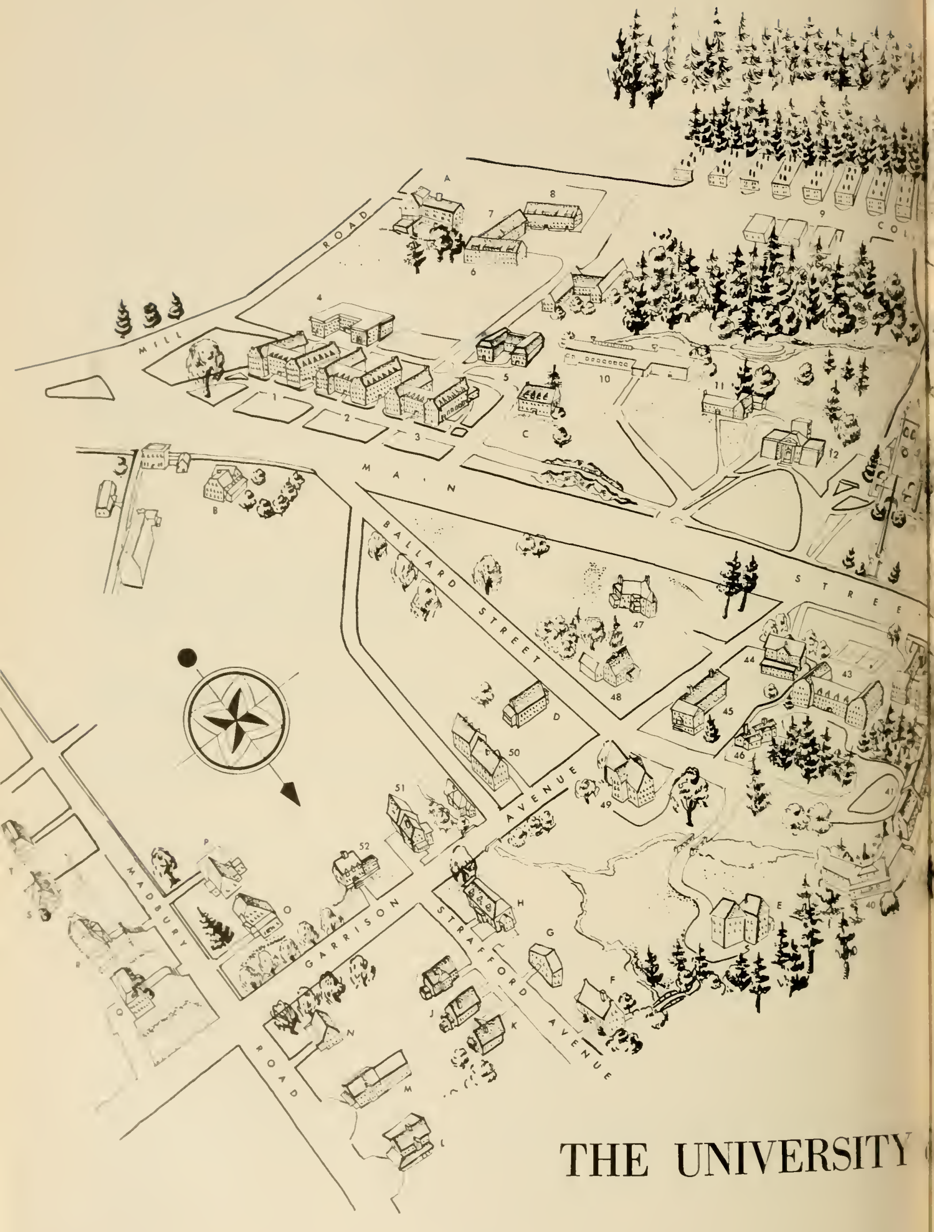
25 Power Plant, heating facilities for all University buildings

26 Pettee Hall, ROTC divisions; home economics and agricultural engineering in Agriculture

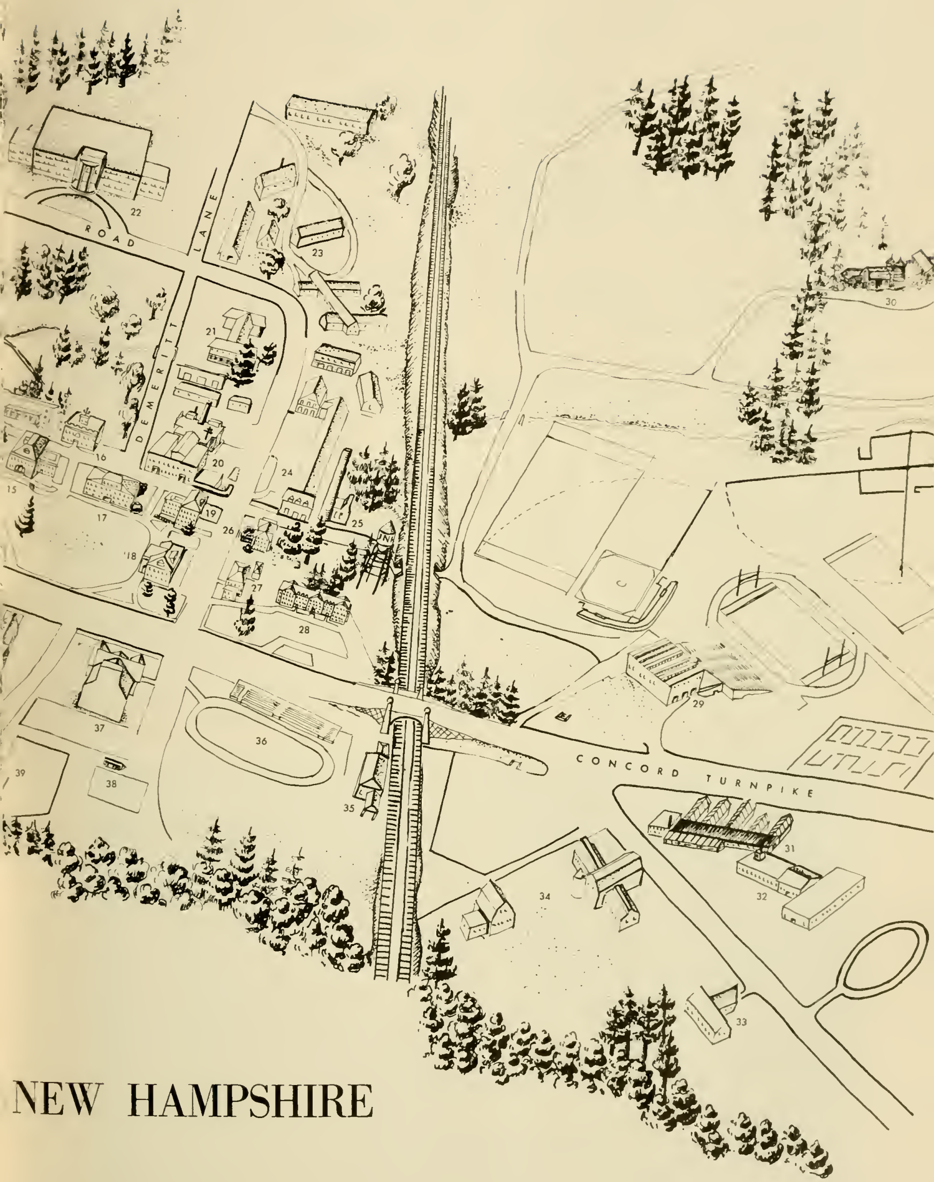
27 Dairy Building, dairy husbandry in Agriculture; manufacturing and processing of ice cream and milk

28 Nesmith Hall, agronomy, animal husbandry, botany, entomology, horticulture, and poultry husbandry in Agriculture; bacteriology and biology in Liberal Arts

(Continued on Page 26)



THE UNIVERSITY



NEW HAMPSHIRE

Campus Map Legend

(Continued from Page 23)

UNIVERSITY BUILDINGS

29 Lewis Fields, men's athletic plant, including field house, Cowell stadium, Brackett field (baseball), tennis courts, and other playing fields

30 Nutrition Barn, agricultural research; animal metabolism laboratory

31 Greenhouses

32 Putnam Hall, Thompson School; livestock and judging pavilion

33 Riding Stable

34 Livestock Barns, two of several used in Agriculture

35 Railroad Station, Boston and Maine Boston-Portland division

36 Memorial Field, women's athletics

37 New Hampshire Hall, women's athletics; 1,000-seat hall used for convocations, lectures, concerts. drama; religious activities offices

38 Batchelder Skating Rink

39 Swimming Pool. an outdoor pool

40 New Hall, women's dormitory

41 McLaughlin Hall, women's dormitory

42 North and South Congreve Halls, women's dormitories

43 Scott Hall, women's dormitory

44 Smith Hall, women's dormitory

45 Sawyer Hall, women's dormitory

46 Nursery School

47 President's House

48 Alumni House, offices of Alumni Association; rooms for visiting alumni and guests; Placement office

49 Ballard Hall, music in Liberal Arts

50 Schofield Hall, graduate house

51 Pettee House, residence for employees

52 Practice House, home economics laboratory in Agriculture

FRATERNITIES AND SORORITIES

A. Acacia, men
B. Alpha Tau Omega, men
C. Kappa Sigma, men
D. Theta Kappa Phi, men
E. Lambda Chi Alpha, men
F. Chi Omega, women
G. Kappa Delta, women
H. Alpha Xi Delta, women
I. Alpha Gamma Rho, men
J. Tau Kappa Epsilon, men
K. Phi Kappa Alpha, men
L. Phi Delta Upsilon, men
M. Phi Mu, women
N. Phi Alpha, men
O. Alpha Chi Omega, women
P. Theta Upsilon, women
Q. Sigma Alpha Epsilon, men
R. Sigma Beta, men
S. Phi Mu Delta, men
T. Theta Chi, men

(Continued from Page 22)

Room rent is payable in advance. For those entering in the fall the first half year's room rent must be paid not later than August 15, and for other semesters no later than the last business day before start of classes. Reserved rooms will be held only until August 15 unless the rent is paid before that date.

Rooms paid for and not occupied one day after registration may be declared vacant and the room rent returned, unless the individual holding the reservation makes a written request to the Manager, University Housing, to hold the room until a later date. The advance payment for the room will not be returned to those making this special request. No room will be reserved for more than ten days after the registration date. If a student occupies a room and then withdraws from the University, his room rent will be refunded as follows: if withdrawal is within four days following his registration, three-fourths refund: after four days and within thirty, one-half refund; after thirty days, no refund. Early application is necessary in order to secure a choice of rooms. Rooms in private houses may be secured for prices somewhat above those in dormitories.

A woman student, who does not live at home, is required to room in one of the women's dormitories or a sorority house, unless she is working for her room in a private family. A competent house director is in charge of each women's dormitory.

Board — Dining Halls are operated and supervised by the University for the accommodation and benefit of the student. All freshmen, except those whose rooms and meals are provided at home or who are working for their meals, are required to board at the

Congreve Hall, one of seven dormitories available for women students.

University Undergraduate Dormitories

Hall	Date Built	Number of Rooms		Rent per Student per Year	
		Single	Double*	Single	Double
	Men				
Alexander	1951	13	64	$240.00	$220.00
College Road†	1947	4	26	165.00	145.00
East-West†	1918	1	116	165.00	145.00
Engelhardt	1946	22	42	195.00	175.00
Fairchild	1916‡	46	47	230.00	210.00
Gibbs	1946	22	42	195.00	175.00
Hetzel	1925	33	59	230.00	210.00
Hunter	1946	22	42	195.00	175.00
	Women				
Congreve North	1940	67	10	235.00	215.00
Congreve South	1920	61	47	225.00	205.00
Sawyer	1951	7	60	240.00	220.00
McLaughlin	1954	21	52	240.00	220.00
Scott	1932	49	36	230.00	210.00
Smith†	1908	13	28	180.00	160.00
New Hall	1957	9	55	240.00	200.00

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* If, on a date to be announced (approximately 30 days after the start of a semester), one student is occupying a double room he will be charged $10 extra for the semester. A student wishing to avoid this charge must inform his house director he wants reassignment. If on this same date a room is necessarily occupied above normal capacity, each occupant will receive a rebate of 20 percent of the semester room rent.

† Frame construction; Smith is brick veneered. All other dormitories are fire-resistant.

‡ Renovated in 1951.

Commons Dining Hall for the first two semesters of attendance at the University. The aim of this regulation is to insure a broad fellowship and to safeguard the health of the first-year students by offering skilled dietetic supervision in selection and preparation of their food. The dining halls are equipped with the best appliances for cooking and serving on a large scale, and are subject to constant sanitary inspection by the University Physician. Board in the Freshman Dining Hall in 1958-59 is expected to be $155 per semester, payable at registration for each semester.

Cafeterias in the Commons and the Memorial Union are open to all students of the upper classes who may desire to take advantage of the moderate price and the high quality of food available. In the Commons cafeteria in 1957-58. 21-meal weekly tickets were $12.

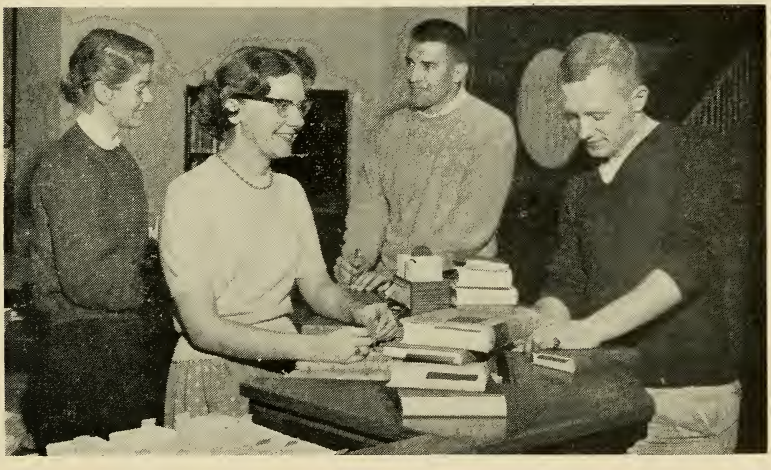
Personal Cash Deposit — Students are urged to arrange personal checking accounts, or to place money on deposit in the Business Office until needed, in order to avoid possible loss resulting from keeping on hand considerable sums of money. Such banking arrangements will also facilitate payment at registration periods. The Business Office will accept and cash student checks.

Financial Aid For Students

The parents of many students at the University may find it a burden to bear the entire cost of four years of college education. This situation frequently is relieved in one or more of three ways: The student may help by working during the summer and in his spare time during the college year; the University or other organizations may grant a scholarship; the student may borrow from the University Loan Fund. A bulletin describing in detail ways of financing an education at the University of New Hampshire has been prepared. Although some information on this topic follows, a student with money problems should request the bulletin, *Scholarships and Financial Aid*. Included in that bulletin is a list of all University of New Hampshire scholarships.

Student Work — During the college year, some students find employment as library assistants, assistants in instructional or research laboratories, counselors in dormitories, clerks in offices, workers in the dining halls, student janitors, and student workers on the University farms and about the campus. Others find employment in fraternities, sororities, and in stores and households in the community.

A student in good health and of good academic ability should be able to earn in the neighborhood of $150 by working about 10 to 12 hours a week during the college year.



Many students finance part of their education by working on campus.

Women students who wish to earn their room and board in private families must apply to an Associate Dean of Students, who will supervise the making of arrangements. Freshman women are advised against attempting to earn their room and board in this way unless they are in good physical condition and have had excellent preparation for their University work.

Scholarships

About 950 scholarships are awarded each year through the University Scholarship Committee. Many of these are open for freshman applications.

The total annual value of the scholarships is more than $135,000. Most of them pay $150 a year, though a few pay less and a few pay substantially more. Most of the scholarships are awarded to students with better than average scholastic records and a definite need for financial assistance. A few are awarded solely on the basis of outstanding accomplishment, while a number are awarded primarily on the basis of financial need. In addition to the scholarships offered by the University, in many communities there are available scholarships for high-school graduates who are planning college study. These usually are awarded by a local service or women's club or by a trust fund. Local banks frequently have information about such trust funds. Applicants for admission who live in New Hampshire may obtain scholarship information from their high-school principals or the University Director of Admissions. The financial adviser for students is the Finanical Aids Officer. Students with special financial problems should contact him.

Applications by upperclassmen for scholarships should be filed by April 15 of the year preceding that for which the scholarship is sought. Applications by freshmen should be made by July 15.

University Loan Fund

In order to assist needy students to continue their education, the University has established a Loan Fund. After proper investigation and approval by parents, loans may be granted to responsible students for tuition or other college expenses, except that Freshmen may borrow not in excess of $100.

The Programs of Study

The work of the University is divided so that when a student decides upon a general field of studies or a vocation, he is guided into a curriculum fitted to his purpose. The student who chooses the General Liberal Arts curriculum takes several courses in the subject he chooses as his *major*, but elects many other courses to broaden his education. The student who chooses certain of the engineering curriculums, on the other hand, is confined principally to courses prescribed for him, all of which are technical or scientific, except for two or three courses in English and economics. The other curriculums fall between these two extremes.

Except for the desirability of choosing among the three broad fields of Agriculture, Liberal Arts, and Technology, the freshman entering the University may delay selection of a curriculum until he has been in attendance for a semester or more. Although there are some advantages in making an early decision, even when a student feels sure of his choice, he should bear in mind the possibility that he may change his mind and that it is well to avoid over-specialization in high school or in the first part of a college career. No one can foresee the trend of the future. Therefore, the wise person is one who is prepared to make his way in more than one field.

The high-school senior should talk over his future plans with his teachers, guidance officer, and principal. *Officials of the University also will be glad to consult with him, preferably in an interview, but if that is not feasible, by mail.*

Each year, the University gives the entering freshman a series of tests. The object of these tests is to furnish additional information to enable the faculty of the University to help the student choose the curriculum for which he is best fitted. The faculty advisers and the Counseling Service staff use these tests to help students solve their educational and personal problems.

Certain courses are pursued by all students in the University. English is required of all students in the freshman year. During their first six semesters of attendance women students are required to take physical education. All men students, except those who have been in the military service, are required to take physical education for two semesters and military training during their first four semesters.

The University reserves the right to withdraw any course or curriculum announced in the catalogue or to substitute other courses or curriculum therefor.

Agricultural students measuring plant nutrients with Geiger counter.

Some of the words used to describe academic work will be unfamiliar to the person who has not been to college. For this reason the following terms used in this section are defined.

Semester. This is half of the college year. The fall semester starts in September and ends about the last of January. The spring semester starts about the first of February and ends in June.

Semester Hour. The semester hour represents one hour of class or about two hours of laboratory each week for a semester. Most college courses meet three days a week for an hour each day. They therefore are valued at three semester hours. A science course with three class meetings a week plus one laboratory period would have a value of four semester hours. In the College of Liberal Arts, 128 semester hours are required for graduation; in Agriculture, 136; and in Technology, 144.

Course. This term is used to describe the work of a semester in a specific subject such as algebra, American history, or organic chemistry. Each course has assigned to it a value in semester hours credit.

Curriculum. This is a plan of study made up of courses arranged to satisfy the requirements for graduation in a particular field, for example. Civil Engineering, Poultry Husbandry, Business, or General Liberal Arts.

Major. A student in the General Liberal Arts curriculum chooses some subject such as English, Zoology, or History as his principal subject. This is said to be his major.

For convenience in administration the undergraduate work of the University is divided into three Colleges: Agriculture, Liberal Arts, and Technology.

The College of Agriculture

The College of Agriculture offers curriculums planned to give the student a broad general education as well as training in the basic sciences and specific instruction in technical phases of Agriculture, Forestry, and Home Economics.

The following degrees are offered: Bachelor of Science in Agriculture, Bachelor of Science in Agricultural Engineering, Bachelor of Science in Forestry, and Bachelor of Science in Home Economics.

Each student should determine the curriculum for which he possesses the greatest interest and aptitude.

Students are given opportunities to prepare for graduate study and eventual professional work or for specific positions with the many services associated with the production, processing, and distribution of agricultural products.

Study of Blackberry flower
Note the numerous stamens
enlarged receptacle bearing
distinct pistils
plan of the blackberry
follow

Students learn to work with a microscope in this Botany laboratory.

Learning to make all kinds of ceramics under a world-famous potter.

Numerous positions are available in production, cooperative extension, research, teaching, and civil service work both with the national and state governments. The curriculums in the college are:

Agriculture

Agricultural and Biological Chemistry
Agricultural Economics
Agronomy
Animal Husbandry
Botany
Dairy Husbandry
Entomology
General Agriculture
Horticulture
Mechanized Agriculture
Poultry Husbandry
Pre-Veterinary
Teacher Preparation in Agriculture

Agricultural Engineering

Agricultural Engineering

Forestry

General Forestry
Wildlife Management

Home Economics

General Home Economics
Food, Nutrition, and
  Institutional Management
Clothing and Textiles
Teacher Preparation in
  Home Economics

Courses taken during the freshman year are: English, agricultural orientation, general chemistry, algebra, botany, physical education, zoology, and military or air science (for men). In addition an elective subject in the student's major field of interest is recommended.

During the following three years courses are taken in the biological sciences, agricultural chemistry, economics, English, physics (except in certain curriculums in Home Economics), social sciences, additional courses in the student's chosen curriculum, and elective courses.

For graduation 136 credit hours are required for all curriculums except for Agricultural Engineering where 144 hours are required.

Typical courses in the various fields of specialization include:

Agricultural and Biological Chemistry — biological chemistry, chemistry of plant growth, chemistry of human and animal nutrition, physiological chemistry, agricultural analysis.

Agricultural Economics — farm management, cooperative business, marketing, agricultural policy.

Agronomy — soils, fertilizers, cereal crops, potatoes, forage crops, seed testing, soil conservation, soil physics, soil chemistry.

Agricultural Engineering — agricultural power and machinery, agricultural shop, agricultural structures, calculus, surveying, soil and water engineering, machine drawing, kinematics, mechanics, thermodynamics, electrical machinery.

Animal Husbandry — types of livestock, livestock judging, feeds and feeding, anatomy, diseases, meat products, animal breeding.

Botany — general botany, plant anatomy and cytology, systematic botany, plant pathology, plant physiology, and plant ecology.

Dairy Husbandry — fundamentals of dairying, dairy cattle, market milk, ice cream, butter and cheese, dairy bacteriology, judging, milk production.

Entomology — economic entomology, insects of orchard and garden, forest insects, medical entomology.

Forestry — tree and wood identification, silviculture, forest protection, forest mensuration, use of air photos, forest utilization, forest recreation, forest management, wildlife management.

Mechanized Agriculture — farm shop, farm structures, farm wiring and electrical equipment, farm power and machinery.

Home Economics — clothing and textiles, food and nutrition, child development, home management, institutional management, hospital dietetics, home economics education, extension.

Horticulture — vegetable gardening, judging, ornamental woody plants, elementery landscape gardening, floral arrangement, greenhouse management, beekeeping, orchard fruits, small fruit culture, commercial vegetable production, plant breeding and propagation.

Poultry Husbandry — farm poultry, poultry breeding, judging, incubation and brooding, marketing, feeding, housing, poultry management, poultry diseases, turkey production.

This class in Government is typical of student-teacher relationship.

Thompson School of Agriculture

The Thompson School of Agriculture is a part of the College of Agriculture. It offers training on a non-degree level. Any high-school graduate of good character or any student who has completed a minimum of two years of high school and is eighteen years of age or over may be admitted. Two years of class work and two years of summer placement for supervised farm experience are required for graduation.

The courses in the Thompson School are designed for young men and women who are interested in farming and its closely allied occupations. The program is vocational in nature. Because graduates of this school receive practical experience as well as an academic training, they are able to secure employment as trained workers. Opportunities for employment are numerous. The four majors offered are: Dairying, General Farming, Horticulture, and Poultry.

Students interested in this sort of training should request the catalogue of the Thompson School of Agriculture.

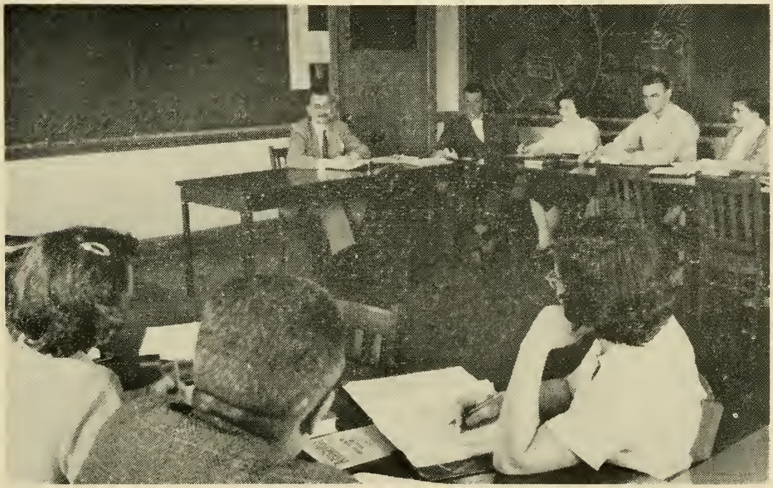
The College of Liberal Arts

The offerings of the College of Liberal Arts fall into three groups: (1) General Liberal Arts; (2) Business and Professional Training (except teaching); and (3) Teacher Preparation.

General Liberal Arts

The student who elects the General Liberal Arts curriculum is given the opportunity to secure a broad general education in such divisions of learning as social science, the humanities, biological science, and physical science. Each student pursuing the General Liberal Arts curriculum must pass a reading test in a foreign language before graduation. A major may be taken in any of the following subjects: The Arts, Bacteriology, Biology, Botany, Chemistry, Economics, Education, English, Entomology, General Physical Science, Geology, Government, History, History and Literature, Foreign Languages, Mathematics, Music, Physics, Psychology, Sociology, or Zoology.

In his first year, a student following the General Liberal Arts curriculum will take, in addition to physical education and (if a male) military training, an introduction to contemporary civilization, freshman English, and either biology or a course in physical science chosen from chemistry, geology, mathematics, or physics. His fourth course usually will be exploratory, an introductory course in the field in which he may later decide to major.



Round table discussion is the teaching method used in some courses.

In his sophomore year, the General Liberal Arts student will continue a broadening education by fulfilling what are known as *Sophomore Group Requirements.* These require each student to take courses in each of the following groups:

Group I
Introduction to The Arts
English Literature
American Literature
Humanities
Foreign Languages
Appreciation of Music
Philosophy

Group II
Biology
Chemistry
Geology
Mathematics
Physical Science
Physics

Group III
Economics
Government
Human Relations
Psychology
Sociology

A student may choose a major at the end of his freshman year, or he may postpone his decision as late as the end of the sophomore year. A minimum of 24 semester credits is required in the major though some majors may require one or more additional courses which do not count for major credit. The General Liberal Arts curriculum is intended to provide a concentration in a limited area but in no sense is it designed to prepare students completely for a specific vocation.

Business and Professional Training

The second group of offerings includes several prescribed curriculums affording preparation for certain vocations. These curriculums are: Business (with Accounting option), Hotel Administration, Medical Technology, Nursing, Occupational Therapy, Pre-Medical, Secretarial, and Social Service.

During the freshman year, students following one of the prescribed curriculums take courses or have programs of courses very similar to those of students following the General Liberal Arts curriculum. The first year, those who are going into scientific fields usually take two sciences instead of one. In general, however, *the work of the first year is broadening, rather than specialized.* Students following a prescribed curriculum are not held for the language reading requirement, but an attempt is made to broaden the curriculums by including one year's work in both the Humanities and the Social Sciences. Required courses in the various prescribed curriculums in the sophomore, junior, and senior years include the courses listed. The balance of a student's program is made up of electives.

Business — accounting U. S. economic development, business communications, corporation finance, economics and business statistics, principles of economics, commercial law, marketing, public speaking, money and banking, business management, labor economics, plus four courses which must be elected from other offerings in the Department of Economics and Business Administration.

Students choosing the *Accounting Option* in the Business curriculum take all the foregoing courses except business management, labor economics, and the four elective courses, but in addition must take introduction to business, intermediate accounting, cost accounting, advanced accounting, federal tax accounting, auditing, analysis of financial statements, and personnel administration.

Hotel Administration — chemistry for the freshman science, hotel orientation, elementary drafting, elementary accounting, hotel accounting, hotel engineering, hotel management lectures, hotel operation, principles of economics, commercial law, foods, quantity cookery, psychology, textiles and furniture, circuits and appliances, heating and ventilating, and introductory physics.

Medical Technology — chemistry and biology for freshman science, mathematics, quantitative analysis, organic chemistry, physiological chemistry, human anatomy-physiology, general bacteriology, pathogenic bacteriology, immunology and serology, and introductory physics.

Students in this curriculum spend six semesters on campus, then register for Biology 61-62 and complete one year under supervision in the laboratory at the Mary Hitchcock Memorial Hospital in Hanover, New Hampshire.

When all the requirements for the B.S. degree have been completed, the student will normally also be prepared for the "Medical Technologist" examination for certification.

Nursing — chemistry and biology for the freshman science, human anatomy-physiology, histology and microtechnique, and organic chemistry.

Three years on campus are followed by a three-year training period in an approved hospital.

Occupational Therapy — biology for the freshman science, sociology, drawing and design, crafts, ceramics-modeling and puppetry, general psychology, mental hygiene, developmental psychology, psychopathology, human anatomy-physiology, lettering and printing, theory of occupational therapy, elementary processes in wood and plastics, clinical subjects, neurology, and kinesiology.

Students planning on this curriculum must take a series of examinations preceding the sophomore year. The results of these will be used in advising the student whether or not he or she may continue in the curriculum.

Pre-Medical — chemistry and mathematics for the freshman science, biology, general zoology and comparative anatomy, qualitative analysis, physics, organic chemistry, social science, humanities and language.

Modern dance is a popular offering in Women's Physical Education.

Secretarial — introduction to business. shorthand. typing. filing. office machines. office procedure and practice. business writing. U. S. economic development. accounting. and commercial law.

Social Service — biology for freshman science. general psychology. mental hygiene. public health and sanitation. social psychology. urban sociology. crime in American society. marriage and the family. introduction to social welfare. methods of social research. social research seminar. social welfare field experience and one course selected from an approved list in botany. entomology. and zoology.

Teacher Preparation

Students may prepare for teaching in the secondary schools of New Hampshire and neighboring states either in a General Liberal Arts major or in one of the specialized teacher preparation curriculums.

Usually only those who have objectives which can be met in no other way will be majors in the Department of Education. Most of those planning to teach in the secondary schools will major in a particular subject-matter area such as Biology. English. Government. History. Languages. Mathematics. Professional courses in Education required for state certification are taken as electives while completing the requirements for the Bachelor of Arts degree.

Those students who are interested in the specialized areas of Art. Music. or Physical Education may complete the requirements for the Bachelor of Science degree in one of the following prescribed curriculums.

All these curriculums include educational psychology, principles of American secondary education, supervised teaching, social science, humanities*, and planning for teaching in high school.† Other courses are included as shown.

Art Education — basic design, drawing and design, ceramics, advanced drawing and painting, commercial design, introduction to The Arts, stagecraft, home decoration, history of costume, crafts, advanced painting and composition, and problems of teaching art.

Music Education — sight singing, ear training and dictation, harmony, music history and literature, applied music, music organizations, principles of conducting, problems of teaching elementary school music, French, German, or Italian, teaching of brass, percussion, strings, and woodwinds, orchestration and chorestration, and problems of teaching secondary school music.

Physical Education Teacher Preparation for Men — major teaching subject, minor teaching subject, principles of physical education, human anatomy-physiology, directed teaching in physical education, problems of teaching in physical education, problems of coaching, and administration of physical education.

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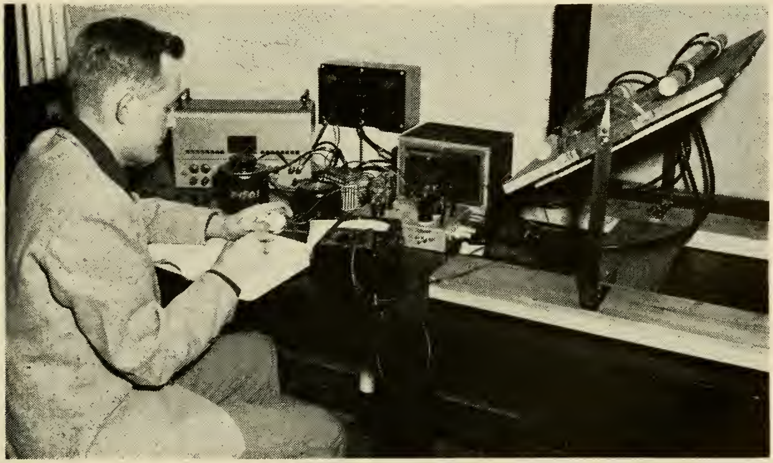
* Humanities is not specified in Music-Education.

† Planning for teaching in the high school is not included in Women's Physical Education.



A student in physics compiles data while performing an experiment.

Physical Education Teacher Preparation for Women — principles of physical education, human anatomy-physiology, recreation leadership, survey of dance, health education, theory of team sports, kinesiology, remedial gymnastics, administration of physical education for women, theory of individual sports, problems of teaching physical education for women, and directed teaching of physical education for women.

Students who desire to prepare themselves as playground directors, etc., may elect to follow the *Recreation Option*. In the junior and senior years this option substitutes for certain courses in the Physical Education Teacher Preparation program the following: stagecraft, crafts, dramatics workshop, organized camping, woodcraft for women, music appreciation, social psychology, an additional elective in the humanities plus recreation field work.

Other Opportunities

Interested students may pursue courses which give preparation in the areas of Applied Biology, Biological Laboratory Technique; for a number of professions such as dentistry, law, teaching, library work, and so on. The student who can afford it will be better prepared if he takes a four-year Liberal Arts course and then obtains his professional training on the graduate level. *A student who is interested in a combination of courses not listed in a regular curriculum will find it easier to arrange what he wants in the College of Liberal Arts than in either of the other Colleges.*

The College of Technology

The College of Technology offers curriculums in Chemistry, Mathematics, Physics, and the following branches of Engineering: Chemical, Civil, Electrical, and Mechanical. Mathematics and the physical sciences are basic for all Engineering curriculums. Students who have done well in these subjects in high school should not find it difficult to carry the work in this field.

The freshman year for all curriculums in the College of Technology includes algebra, trigonometry, analytic geometry, introduction to calculus, general chemistry, engineering drawing, and English. The Chemical Engineering curriculum includes engineering materials.

In the sophomore year all Technology students take calculus, general physics, and economics. Other courses of the different curriculums in the sophomore, junior, and senior years include:

Chemical Engineering — semi-micro qualitative analysis, quantitative analysis, organic chemistry, process engineering principles, unit processes, physical chemistry, unit operations, fundamentals of electricity, chemical engineering economics, unit operations labor-

A mathematics class in statistics makes use of computing machines.

atory, chemical engineering thermodynamics, chemical engineering project, chemical literature and seminar, chemical plant design, and mechanics or elective.

Chemistry — semi-micro qualitative analysis, quantitative analysis, German, organic chemistry, technical quantitative analysis, instrumental analysis, physical chemistry, chemical literature and seminar, and thesis.

Civil Engineering — surveying, route surveying, engineering materials, fluid mechanics, theory of structures, general geology, mechanics, heat power engineering, fundamentals of electricity, highway engineering and transportation, soil mechanics and foundations, hydraulic and sanitary engineering, structural design in steel, structural engineering, reinforced concrete design, and writing of technical reports.

Electrical Engineering — electrical engineering components, magnetic fields and circuits, direct and alternating current machinery, theory and laboratory, alternating current circuit theory, networks and transmission lines, transient analysis of networks, electronic tubes and components, electronic circuits, communication systems, industrial electronics, advanced project laboratory for power and electronics, electrical measurements, illumination, differential equations, kinematics, heat power engineering, mechanical laboratory, mechanics, technical report writing, industrial management, and engineering economy.

Mathematics — French, German, differential equations, applied mathematics, introduction to analysis, higher algebra, mathematical statistics, astronomy, advanced calculus, theory of functions, physical mechanics.

Mechanical Engineering — machine drawing, kinematics, manufacturing processes, electrical machinery, mechanics, thermodynamics, mechanical laboratory, engineering materials, fluid mechanics, machine design, power plants, internal combustion engines, industrial management, engineering economics, and writing of technical reports.

Physics — German, general physics, applied mathematics, differential equations, optics, heat, theory of electricity and magnetism, physical mechanics, modern physical theories, theoretical physics, advanced laboratory, electronics, electrical discharge through gases, and advanced calculus.

Other Programs of Study

The Graduate School

The Graduate School, has offered instruction since 1903, with the objective of the bringing together faculty and qualified students in a spirit of scholarship and research. The graduate student is given opportunity to specialize in some field of knowledge, and to develop a maturity of thought and attitude toward his professional field, so that both his professional and his cultural life are enhanced. The Faculty of the Graduate School is drawn from the regular departmental staffs in all three Colleges of the University.

The Dean of the Graduate School is responsible for the administration of the regulations and requirements pertaining to admission, conduct of work, the granting of advanced degrees, and other pertinent matters.

Graduate programs at the Masters' degree level are offered by the following departments: Agricultural and Biological Chemistry, Agricultural Economics, Agricultural Education, Agronomy, Animal Husbandry, Bacteriology, Biology, Botany, Chemical Engineering, Chemistry, Civil Engineering, Dairy Husbandry, Electrical Engineering, Entomology, Forestry, Home Economics, Horticulture, Mathematics, Mechanical Engineering, Physics, Poultry Husbandry, and Zoology leading to the Master of Science degree: Economics, English, Government, History, Languages, Mathematics, Psychology, and Sociology leading to the Master of Arts degree: and Education leading to the Master of Education degree.

Programs leading to the Doctor of Philosophy degree are offered in Botany, Chemistry, Horticulture, and Zoology.

Graduate assistantships are available in a number of departments. The work required may be in the nature of research, teaching, or general service. For information regarding assistantships, one should direct inquiries to the chairman of the department concerned.

Tuition scholarships are available for as many as twenty superior graduate students each semester. Application forms and other pertinent information may be obtained from the Dean of Graduate School.

For a Graduate School Catalogue or detailed information concerning admission, requirements for degrees, description of courses open to graduate students, and other matters not covered above, write to the Dean of the Graduate School.

The Summer Session

The Summer Session is an integral part of the University program. Courses are offered by the three Colleges and the Graduate School to meet the needs of teachers, administrators, and supervisors of elementary and secondary schools; students who seek special professional preparation or are working for undergraduate or graduate degrees; students who anticipate courses or are supplying deficiencies; qualified and mature persons who wish to take courses for general cultural purposes. Qualified instructors are drawn from the University faculty and are supplemented by specialists selected for their attainments in particular fields at other institutions. The catalogue of the Summer Session gives specific information as to courses.

In addition to the offerings available at the University in Durham, summer instruction is given in Forestry and Fish and Game Management at the Forestry Summer Camp.

Reserve Officers Training Corps

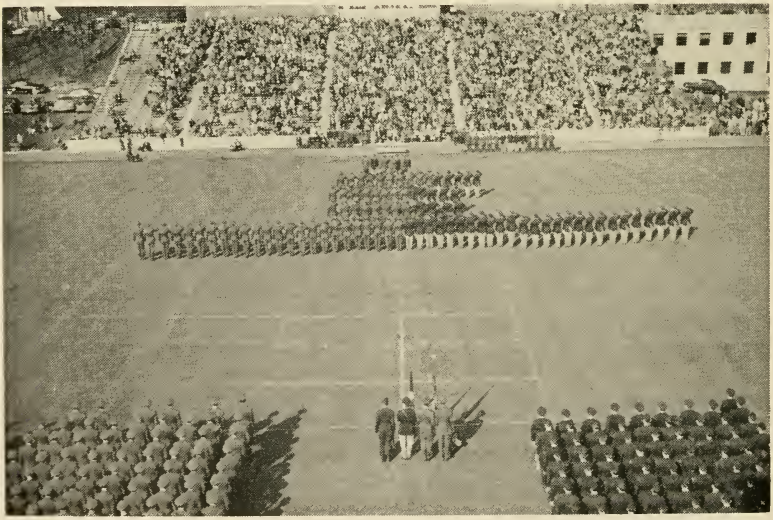
In cooperation with the Federal Government, the University maintains a Reserve Officer Training Corps as a part of the federal system to provide trained reserve officers for the military services. There are Army and Air Force units.

While the Federal Government supervises the training, details officers and non-commissioned officers as instructors, and provides the necessary equipment, students who are members of the ROTC are in no way members of the military forces. Under the present provisions of the National Selective Service Act, certain qualified students may, upon signing a deferment agreement, be deferred from induction into the armed forces during the period of enrollment in the ROTC. Students signing a deferment agreement consent to enroll in the advanced course (junior and senior years), if offered the opportunity. Those enrolling in the advanced course agree to attend ROTC summer camp and to complete the course of instruction as a prerequisite to graduation. Those in the advanced course receive a monetary subsistence allowance of about $275 per academic year.

Students enrolled in the ROTC will be furnished uniforms which are worn during military instruction, when prescribed. A deposit of $15 is required of each student having military clothing or equipment in his possession. This deposit is returned when the student completes his ROTC instruction, except that a reasonable deduction will be made to cover loss or any unusual wear. Those completing the advanced course are allowed to keep their uniforms.

Transfer students (at the junior and senior class level) and freshmen entering with previous military training should consult the ROTC officers regarding the possibility of qualifying for enrollment.

Students satisfactorily completing the advanced course are, upon graduation, ordinarily commissioned as reserve second lieutenants. Students designated as Distinguished Military Students during the second year of the Army advance course are eligible to apply for direct appointments as commissioned officers in the Regular Army. Air Force officers may apply for regular Air Force commissions upon completion of 18 months' active duty.



A crowd of spectators in Cowell Stadium watches a military review.

Officers of Administration

Eldon L. Johnson, President

Edward D. Eddy, Jr., Vice-President and Provost

Doris Beane. University Recorder

Edward Y. Blewett, Dean of the College of Liberal Arts

Thelma Brackett, Librarian

Harry R. Carroll, Director of Admissions

Jere Chase, Director of University Development

Edward T. Donovan, Acting Dean of the College of Technology and Director of the Engineering Experiment Station

Robb G. Gardiner, Associate Dean of Students

Harold C. Grinnell, Dean of the College of Agriculture

Samuel W. Hoitt, Director of the Cooperative Extension Service

Charles H. Howarth, M.D., University Physician and Director of the Student Health Service

Peter Janetos, Director of Placement and Director of the Summer Session

Harry A. Keener, Director of the Agricultural Experiment Station

Harold I. Leavitt, Superintendent of Properties

Paul H. McIntire, Director of Counseling

Margaret McKoane, Associate Dean of Students

Norman W. Myers, Treasurer

John F. Reed, Dean of the Graduate School

Donald H. Richards, Alumni Executive

Mathias C. Richards, Associate Dean of the College of Agriculture

Everett B. Sackett, Dean of Students

Paul E. Schaefer, Associate Dean of the College of Liberal Arts

Further Information

Correspondence in regard to the University of New Hampshire and its programs of instruction should be addressed to the following:

Admission to the Undergraduate Colleges

Director of Admissions
Thompson Hall, Durham, N. H.

Graduate School

Dean of the Graduate School
Kingsbury Hall, Durham, N. H.

Summer Session

Director of Summer Session
Alumni House, Durham, N. H.

Thompson School of Agriculture

Head, Thompson School of Agriculture
Putnam Hall, Durham, N. H.

Agricultural and Home Economics Extension

Director of Cooperative Extension Service
Thompson Hall, Durham, N. H.

University Extension

Director of University Extension Service
Commons, Durham, N. H.

Alumni Activities

Alumni Executive
Alumni House, Durham, N. H.

University Catalogue

1958-1959

An Issue

of the

Bulletin of the

University of New Hampshire

Vol. XLIX April 1958 No. 7

Foreword

This issue of the Bulletin of the University of New Hampshire provides a detailed description of curriculums, courses, and requirements for study at the University.

Other information about the University — its history, its general philosophy and objectives, its buildings and equipment, its student personnel services, student organizations, methods of admission, and student fees and expenses — will be found in the *General Information 1958-59* issue of the Bulletin.

Detailed information about financing an education at the University, including a list of scholarships and loan funds available, will be found in a publication called *Scholarships and Financial Aids.*

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CALENDAR

1958

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University Calendar

1958

Summer Session

June 23	Monday	Registration and first day of class, eight-week session
July 1	Tuesday	Registration, six-week session
July 2	Wednesday	Classes start, six-week session
July 4	Friday	Fourth of July — holiday
Aug. 12	Tuesday	Classes end, six-week session
Aug. 15	Friday	Classes end, eight-week session

1958

First Semester

Sept. 19	Friday	First Faculty meeting
Sept. 19	Friday, 9 a.m. to 4 p.m.	Registration for re-admissions, transfers, and graduate students
Sept. 22-24	Monday to Wednesday	Orientation
Sept. 25	Thursday	Classes start, 8:00 a.m.
Oct. 18	Saturday	Homecoming
Oct. 24	Friday	High School-University Day
Nov. 1	Saturday	Dad's Day
Nov. 17	Monday	Mid-semester reports to be filed, 9:00 a.m.
Nov. 26	Wednesday	Thanksgiving recess starts, 12:30 p.m.
Dec. 1	Monday	Classes resume, 8:00 a.m.
Dec. 20	Saturday	Christmas recess starts, 12:30 p.m.

1959

Jan. 5	Monday	Classes resume, 8:00 a.m.
Jan. 20-22	Tuesday to Thursday	Drop and Adds for Second Semester accepted
Jan. 26	Monday	Examinations start
Feb. 3	Tuesday	Examinations end

Second Semester

Feb. 9	Monday	Classes start, 8:00 a.m.
Mar. 28	Saturday	Mid-semester reports to be filed, 9 a.m.
Mar. 28	Saturday	Spring recess starts, 12:30 p.m.
April 6	Monday	Classes resume, 8:00 a.m.
May 2	Saturday	Mother's Day, classes end at 11:00 a.m.
May 5-19	Tuesday to Tuesday	Pre-registration period
May 30	Saturday	Memorial Day — holiday
June 1	Monday	Examinations start
June 9	Tuesday	Examinations end
June 14	Sunday	Commencement
June 19	Friday	Alumni Weekend begins

Board of Trustees

His Excellency, Governor Lane Dwinell, b.a., m.c.s., m.a., ll.d., *ex officio*

Perley I. Fitts, b.s., Commissioner of Agriculture, *ex officio*

President Eldon L. Johnson, a.b., ph.m., ph.d., *ex officio*

Laurence F. Whittemore, m.a., ll.d., President — Pembroke, N. H.
September 14, 1944 to June 30, 1960

Austin I. Hubbard, b.s., Vice-President — Walpole, N. H.
December 20, 1944 to June 30, 1961

*George E. Coleman, Jr., b.s., Secretary — Exeter, N. H.
July 1, 1952 to June 30, 1960

Frank W. Randall, b.s., ll.d. — Portsmouth, N. .H
July 1, 1936 to June 30, 1960

Ernest W. Christensen, b.s. — Dover, N. H.
July 1, 1944 to June 30, 1961

Mary S. Brown — Center Sandwich, N. H.
December 20, 1944 to June 30, 1959

*Anna L. Philbrook, m.d. — Dunbarton, N. H.
July 1, 1949 to June 30, 1959

Maurice F. Devine, ll.b., ll.d. — Manchester. N. H.
July 1, 1950 to June 30, 1958

Walter L. Barker — Nashua, N. H.
September 16, 1952 to June 30, 1959

George L. Frazer — Monroe, N. H.
July 1, 1957 to June 30, 1961

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* Elected by Alumni.

Officers of Administration

Eldon L. Johnson, President

Edward D. Eddy, Jr., Vice-President and Provost

Doris Beane, University Recorder

Edward Y. Blewett, Dean of the College of Liberal Arts

Thelma Brackett, Librarian

Harry R. Carroll, Director of Admissions

Jere Chase, Director of University Development

Edward T. Donovan, Acting Dean of the College of Technology and Director of the Engineering Experiment Station

Robb G. Gardiner, Associate Dean of Students

Harold C. Grinnell, Dean of the College of Agriculture

L. Franklin Heald, Director of Informational Services

Samuel W. Hoitt, Director of the Cooperative Extension Service

Charles H. Howarth, m.d., University Physician and Director of the Student Health Service

Peter Janetos, Director of the University Extension Service and Director of the Summer Session

Harry A. Keener, Director of the Agricultural Experiment Station

Eugene H. Leaver, Assistant Superintendent of Properties and Supervising Architect

Harold I. Leavitt, Superintendent of Properties

Paul H. McIntire, Director of Testing and Placement

Margaret McKoane, Associate Dean of Students

Norman W. Myers, Treasurer

John F. Reed, Dean of the Graduate School, Coordinator of Research, and Special Assistant to the President

Donald H. Richards, Alumni Executive

Mathias C. Richards, Associate Dean of the College of Agriculture

Everett B. Sackett, Dean of Students

Paul E. Schaefer, Associate Dean of the College of Liberal Arts

The University Faculty and Staff *

JOHNSON, ELDON L., *President*
A.B., Indiana State Teachers College, 1929; Ph.M., University of Wisconsin, 1933; Ph.D., *ibid.*, 1939. (1955-)

ABELL, MAX F., *Extension Associate Professor Emeritus of Agricultural Economics*
B.S., Cornell University, 1914; Ph.D., *ibid.*, 1924. (1926-)

BABCOCK, DONALD C., *Professor Emeritus of Philosophy*
B.A., University of Minnesota, 1907; M.A., *ibid.*, 1908; S.T.B., Boston University, 1912. (1918-)

BATCHELDER, LYMAN J., *Instructor Emeritus in Mechanical Engineering, Woodshop* (1915-)

BEVAN, LAURENCE A., *Director Emeritus of the Cooperative Extension Service*
B.S., Massachusetts Agricultural College, 1931. (1946-)

BOWLES, ELLA S., *Publications Editor Emerita*
Plymouth Normal School, 1905. (1943-)

CAMPBELL, WILLIS C., *Research Associate Emeritus, Engineering Experiment Station*
B.S., New Hampshire College, 1906. (1943-)

COULTER, CHARLES W., *Professor Emeritus of Sociology*
B.A., University of Toronto, 1908; B.D., Victoria College, 1909; M.A. Yale University, 1910; Ph.D., *ibid.*, 1914. (1934-)

HEPLER, JESSE R., *Extension Horticulturist Emeritus*
B.S., Pennsylvania State College, 1911; M.S., University of Wisconsin, 1922. (1917-)

HITCHCOCK, LEON W., *Professor Emeritus of Electrical Engineering*
B.S., Worcester Polytechnic Institute, 1908. (1910-)

HOWES, HORACE L., *Professor Emeritus of Physics*
B.S., Syracuse University, 1905; Ph.D., Cornell University, 1915. (1918-)

HUDDLESTON, ERIC T., *Professor Emeritus of Architecture*
B.Arch., Cornell University, 1910. (1914-)

JACKSON, C. FLOYD, *Professor Emeritus of Zoology*
B.A., De Pauw University, 1905; M.S., Ohio State University, 1907. (1908-)

MILLS, MARIAN E., *Assistant Professor Emerita of Botany*
B.S., Teachers College, Columbia University, 1917; M.A., *ibid.*, 1920. (1927-)

O'BRIEN, DANIEL A., *County Agent Leader Emeritus*
Cornell University, 1913. (1920-)

†O'KANE, WALTER C., *Professor Emeritus of Economic Entomology*
B.A., Ohio State University, 1897; M.A., *ibid.*, 1909; D.Sc. (Hon.), *ibid.*, 1932. (1909-)

PHILLIPS, THOMAS G., *Professor Emeritus of Agricultural and Biological Chemistry*
B.S., Ohio State University, 1912; M.S., *ibid.*, 1913; Ph.D., University of Chicago, 1918. (1925-)

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* As of February 1, 1958.

† Indicates part time devoted to Agricultural Experiment Station.

PRINCE, FORD S., *Professor Emeritus of Agronomy and Agronomist Emeritus, Agricultural Experiment Station and Cooperative Extension Service*
B.S., University of Illinois, 1913. (1925-)

SANBORN, MARY L., *Assistant State Club Leader Emerita*
Oread Institute, 1904. (1915-)

SMITH, LUCINDA P., *Associate Professor Emerita of English*
A.B., Colby College, 1901; M.A., Boston University, 1934. (1919-)

SMITH, TODD O., *Research Assistant Professor Emeritus of Agricultural and Biological Chemistry*
A.B., Indiana University, 1910; M.S., New Hampshire College, 1917. (1910-)

STEVENS, HENRY B., *Director Emeritus of University Extension Service*
A.B., Dartmouth College, 1912. (1918-)

TAYLOR, FREDERICK W., *Director Emeritus of Agricultural Service Departments of the College of Agriculture*
B.S., Ohio State University, 1900. (1903-)

TONKIN, JOHN C., *Instructor Emeritus in Mechanical Engineering, Machine Shop* (1910-12, 1924-)

YALE, WILLIAM, *Professor Emeritus of History*
Ph.B., Sheffield Scientific School, Yale University, 1910; M.A., University of New Hampshire, 1928. (1928-)

ABBOTT, HELEN D., *Head Cataloguer*
A.B., Wheaton College, 1929; S.B. in L.S., Simmons College, 1930; A.M., Middlebury College, 1939. (1943-)

ABLETT, PATRICIA A., *Instructor in Physical Education for Women*
B.S., University of Utah, 1957. (1957-)

ADAMS, ELOI A., *Agricultural Agent in Strafford County*
B.S., New Hampshire College, 1918. (1919-)

†ALLEN, FRED E., *Professor of Poultry Science, and Veterinarian, Agricultural Experiment Station*
B.S., University of New Hampshire, 1932; D.V.M., Ohio State University, 1936. (1940-)

ALLING, EDWIN S., *Associate Professor of Civil Engineering*
B.S.E., University of Connecticut, 1950; M. Engr., Yale University, 1951 (1952-)

AMELL, ALEXANDER R., *Assistant Professor of Chemistry*
B.S., University of Massachusetts, 1947; Ph.D., University of Wisconsin, 1950. (1955-)

ANDERSON, CHARLOTTE K., *Assistant Librarian and Documents Librarian*
B.A., University of Michigan, 1935; A.B.L.S., *ibid.*, 1936; A.M.L.S., *ibid.*, 1951. (1943-)

†AYERS, WILLIAM A., *Assistant Professor of Bacteriology*
A.B., University of California, 1949; M.S., Rutgers University, 1951; Ph.D., University of Wisconsin, 1954. (1954-)

BALER, LENIN A., *Associate Professor of Psychology*
A.B., Harvard College, 1947; A.M., Boston University, 1948; Ph.D., *ibid.*, 1950. (1951-)

BALLARD, HORACE C., *Agricultural Agent in Belknap County*
B.S., Cornell University, 1936. (1949-)

BARRACLOUGH, KENNETH E., *Extension Professor of Forestry*
B.S., New York State College of Forestry, Syracuse University, 1921; M.F., Harvard University, 1940. (1926-)

BARTLEY, CLARA H., *Research Associate in Bacteriology*
B.S., Miami University, 1923; M.A., University of Michigan, 1926; Ph.D., University of Kansas, 1935. (1945-)

BARTLEY, IRVING D., *Assistant Professor of Music and University Carilloneur*
B.M., Syracuse University, 1933; M.M., *ibid.*, 1938. (1945-)

BARTON, PHILIP S., *Professor of Agricultural Education and Head, Thompson School of Agriculture*
B.S., University of New Hampshire, 1928; M.Ed., *ibid.*, 1938. (1939-)

BASCOM, WYNNE B., *Instructor in Economics and Business Administration*
A.B., Tufts University, 1952; M.B.A., Babson Institute, 1954. (1957-)

BATCHELDER, GERALD M., *Research Assistant Professor, Engineering Experiment Station*
B.S, University of New Hampshire, 1950; M.S.C.E., Purdue University, 1952. (1953-)

BATCHELLER, JOSEPH D., *Associate Professor Speech*
A.B., Carnegie Institute of Technology, 1936; A.M., University of Minnesota, 1938; Ph.D., *ibid.*, 1942. (1944-)

BEAL, MURIEL E., *Home Demonstration Agent in Grafton County*
B.S., Farmington State Teachers College, 1939. (1951-52, 1953-)

BEANE, DORIS, *University Recorder*
A.B., Smith College, 1919; M.A., Teachers College, Columbia University, 1942. (1923-)

BEARD, DONALD C., *Lecturer in Mathematics*
B.S., U. S. Naval Academy, 1925; S.M. (Comm. Eng.), Harvard University, 1933. (1956-)

BEASLEY, WAYNE M., *Research Assistant Professor, Engineering Experiment Station*
S.B., Harvard College, 1945. (1957-)

BECKINGHAM, KATHLEEN R., *Counselor in the Counseling Service*
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BECKWITH, MARION C., *Director and Professor of Physical Education for Women*
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BEGGS, ANN F., *Extension Associate Professor of Home Economics*
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BENJAMIN, HAROLD H., *Assistant Professor of Education*
B.A., University of Maryland, 1947; M.A., University of Connecticut, 1950; Ph.D., University of Michigan, 1954. (1954-)

BINGHAM, SYLVESTER H., *Professor of English*
A.B., Dartmouth College, 1922; A.M., Harvard University, 1929; Ph.D., Yale University, 1937. (1936-)

BLANCHARD, FLETCHER A., JR., *Associate Professor of Electrical Engineering*
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BLEECKER, C. VINCENT, *Assistant Professor of Music*
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Blewett, Edward Y., *Dean of the College of Liberal Arts*
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†Blickle, Robert L., *Professor of Entomology*
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Blood, Edward J., *Assistant Professor of Physical Education and Athletics*
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*†Blood, Paul T., *Associate Professor of Agronomy*
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Boston, Clarence E., *Associate Professor of Physical Education and Athletics and Head Football Coach*
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Bourne, Elizabeth, *Club Agent in Rockingham County*
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Bowler, Edmond W., *Professor of Civil Engineering*
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Bowley, Freeman W., Jr., *Major, Assistant Professor of Air Science*
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Boyer, Christine A., *Assistant County Club Agent in Merrimack County*
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Brackett, Thelma, *Librarian*
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Bratton, Karl H., *Professor of Music*
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Breck, Robert W., *County Forester in Hillsborough County*
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Breon, Theodore F., *County Forester in Carroll County*
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Brett, Wesley F., *Assistant Professor of The Arts*
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Britton, Albert J., *Captain, United States Air Force, Instructor in Air Science*
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Brown, Hugh G., *Lieutenant Colonel, Professor of Military Science and Tactics*
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* Indicates part time devoted to Cooperative Extension Service.

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Bullock, Wilbur L., *Associate Professor of Zoology*
B.S., Queens College, 1942; M.S., University of Illinois, 1947; Ph.D., *ibid.*, 1948. (1948-)

†Byers, Gordon L., *Associate Professor of Agricultural Engineering*
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Caldwell, S. Anthony, *Instructor in English*
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Call, Reginald, *Assistant Professor of English*
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Carroll, Harry R., *Director of Admissions*
B.A., University of New Hampshire, 1950; M.A., *ibid.*, 1951. (1951-)

Carroll, Herbert A., *Professor of Psychology*
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Casas, R. Alberto, *Associate Professor of Languages*
B.en L., Universidad de Barcelona, 1936; A.M., Columbia University, 1947; Ph.D., *ibid.*, 1954. (1952-)

Chapman, Donald H., *Professor of Geology*
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Chase, Bruce E., *County Club Agent in Coos County*
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Chase, Donald H., *Assistant County Forester in Hillsborough and Rockingham Counties*
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Clark, David G., *Associate Professor of Physics*
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Clark, Ronald R., *Instructor in Electrical Engineering*
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Clark, William E., *Assistant Professor of Mechanical Engineering, Machine Shop*
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Clark, Winifred M., *Instructor in The Arts*
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Clow, Patricia O., *Instructor in Physical Education for Women*
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CRONIN, JAMES F., JR., *Assistant Professor of Economics and Business Administration*
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CUTTER, ARTHUR H., *Assistant Agricultural Agent in Coos County*
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Davis, Marion S., *Home Demonstration Agent in Sullivan County*
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Davis, Myra L., *Assistant Professor of Secretarial Studies*
B.S., Central Missouri State Teachers College, 1939; M.A., State University of Iowa, 1945. (1945-)

Dawson, Charles O., *Professor of Civil Engineering*
B.C.E., Ohio State University, 1930; M.S., *ibid.*, 1940. (1930-)

Degler, Carroll M., *Professor of Economics*
A.B., University of Kansas, 1925; M.B.A., New York University, 1927. (1928-)

Denison, Ellen L., *Home Demonstration Agent in Coos County*
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DiCecco, Luca, *Instructor in Music*
B.M., Indiana University, 1954; M.M., *ibid.*, 1955. (1955-)

Dilts, Peter K., *Major, Assistant Professor of Military Science and Tactics*
B.S., United States Military Academy, 1941. (1956-)

Dishman, Robert B., *Professor of Government*
A.B., University of Missouri, 1939; A.M., *ibid.*, 1940; Ph.D., Princeton University, 1948. (1951-)

Dodds, John A., *Assistant Professor of Dairy Science, Thompson School of Agriculture*
B.S., University of Vermont, 1936. (1953-)

Donovan, Edward T., *Acting Dean of the College of Technology, Acting Director of the Engineering Experiment Station, and Professor of Mechanical Engineering*
B.S., University of Wisconsin, 1921. (1926-)

*†Dougherty, Lawrence A., *Assistant Professor of Agricultural Economics*
B.S., Purdue University, 1921. (1930-)

Doxtator, Robert J., *Assistant Professor of Education*
B.S., Indiana University, 1942; M.S. in Ed., *ibid.*, 1945; Ed.D., University of Colorado, 1954. (1954-)

Drew, William H., *Research Associate Professor of Agricultural Economics*
B.S., Pennsylvania State College, 1947; M.S., Rutgers University, 1949. (1956-)

Duncan, Lillian R., *Loan Librarian*
B.A., University of Oklahoma, 1933. (1934-38, 1945-47, 1948-)

Dunlop, William R., *Research Associate Professor of Poultry Science*
D.V.M., V.S., Ontario Veterinary College, 1938. (1950-)

†Dunn, Gerald M., *Associate Professor of Agronomy*
B.S., West Virginia University, 1948; M.S., Purdue University, 1950; Ph.D., *ibid.*, 1951. (1951-)

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†Durgin, Owen B., *Assistant Professor of Sociology*
B.S., Gorham State Teachers College, 1946; M.A., University of New Hampshire, 1951. (1950, 1951-)

DUTTON, ROBERT H., *Research Associate, Engineering Experiment Station*
B.E.E., University of Florida, 1953. (1956-)

EDDY, EDWARD D., JR., *Vice-President and Provost*
B.A., Cornell University, 1944; B.D., Yale University, 1946; Ph.D., Cornell University, 1956. (1949-)

EGGERT, RUSSELL, *Research Associate Professor of Horticulture*
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ELLIS, ELIZABETH E., *Extension Associate Professor of Home Economics*
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EMERY, HARVARD B., *Instructor in Mechanical Engineering*
Cert. in M.E., Lowell Institute, 1938. (1954-)

FAULKNER, JAMES C., *Associate Professor of Languages*
B.L., France, 1937; C.E.S., France, 1937; D.I.O., Université de Paris, 1938; M.A., Université Laval, 1947; D.Un., *ibid.*, 1950. (1948-)

FELDMAN, CHESTER, *Assistant Professor of Mathematics*
S.B., University of Chicago, 1940; S.M., *ibid.*, 1941; Ph.D., *ibid.*, 1950. (1956-)

FENTON, AUSTEN W., *Agricultural Agent in Carroll County*
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FENTON, PAUL J., *Agricultural Agent in Merrimack County*
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FERGUSON, EMILY W., *Home Demonstration Agent in Merrimack County*
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FINLAYSON, ALEC W., *Instructor in English*
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FISHER, LEONARD A., *Assistant Professor of Mechanical Engineering*
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FOLEY, CONSTANCE M., *Instructor in Mathematics*
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FRICK, GEORGE E., *Lecturer in College of Agriculture*
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FROST, ALBERT D., *Associate Professor of Electrical Engineering*
B.S., Tufts College, 1944; A.M., Harvard University, 1947; Sc.D., Massachusetts Institute of Technology, 1952. (1957-)

FUNKHOUSER, JAMES A., *Professor of Chemistry*
B.S., Carnegie Institute of Technology, 1925; Ph.D., Ohio State University, 1930. (1930-)

GARDINER, ROBB G., *Associate Dean of Students*
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GEORGE, ERNEST A., *Associate County Agricultural Agent, Hillsborough County*
B.S., University of New Hampshire, 1951. (1955-)

GIBSON, MERRITT A., *Instructor in Zoology*
B.Sc., Acadia University, 1951; M.Sc., *ibid.*, 1953; Ph.D., McGill University, 1957. (1957-)

Gill, James W., *Assistant Professor of Poultry Science and Microbiologist*
B.S., Lehigh University, 1953; M.S., Virginia Polytechnic Institute, 1956. (1957-)

Gilman, Paul A., *Associate Professor of Farm Mechanics, Thompson School of Agriculture*
B.S., University of Vermont, 1938; M.S., Pennsylvania State University, 1951. (1945-)

Gilmore, Robert C., *Assistant Professor of History*
A.B., University of Vermont, 1944; M.A., McGill University, 1947; M.A., Yale University, 1951; Ph.D., *ibid.*, 1954. (1952-)

Goffe, Lewis C., *Assistant Professor of English*
B.S., University of New Hampshire, 1935; M.A., *ibid.*, 1946. (1946-)

Graham, Herbert W., *Lecturer in Zoology*
B.S., University of Pittsburgh, 1929; M.A., Stanford University, 1934; Ph.D., *ibid.*, 1938. (1957-)

Granger, Ralph H., *Associate Professor of Poultry Science, Thompson School of Agriculture*
B.S., Massachusetts State College, 1935; M.S., *ibid.*, 1939. (1946-)

Grinnell, Harold C., *Dean of the College of Agriculture and Professor of Agricultural Economics*
B.S., Cornell University, 1921; M.S., *ibid.*, 1930; Ph.D., *ibid.*, 1941. (1932-)

Haendler, Helmut M., *Professor of Chemistry*
B.S., Northeastern University, 1935; Ph.D., University of Washington, 1940. (1945-)

Hahn, Thomas J., *Club Agent in Grafton County*
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Hall, Harry H., *Professor of Physics*
B.S., Union College, 1926; Ph.D., Harvard University, 1934. (1940-)

Hall, Warren A., *County Club Agent in Strafford County*
B.S., University of New Hampshire, 1952. (1956-)

Ham, Ruth S., *Home Demonstration Agent in Strafford County*
B.S., University of New Hampshire, 1924. (1955-)

Hartwell, William H., *Associate Professor of Physics*
B.S., Boston University, 1924; M.A., Wesleyan University, 1927. (1929-)

Harwood, Wilfred, *Cataloguer*
B.A., University of New Hampshire, 1952. (1944-51, 1953-)

Haslerud, George M., *Professor of Psychology*
B.A., University of Minnesota, 1930; Ph.D., *ibid.*, 1934. (1945-)

Hatch, John W., *Associate Professor of The Arts*
Diploma, Massachusetts School of Art, 1941; B.F.A., Yale University School of the Fine Arts, 1948; M.F.A., *ibid.*, 1949. (1949-)

Heilbronner, Hans, *Assistant Professor of History*
A.B., University of Michigan, 1949; A.M., *ibid.*, 1950; Ph.D., *ibid.*, 1954. (1954-)

Henderson, Anne, *Assistant Professor of Occupational Therapy*
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Hennessy, William G., *Professor of English*
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†Henry, William F., *Professor of Agricultural Economics*
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HEYWORTH, PETER L., *Instructor in English*
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†HIGGINS, LEROY J., *Associate Professor of Agronomy*
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†HOCKER, HAROLD W., JR., *Assistant Professor of Forestry*
B.S.F., Pennsylvania State College, 1949; M.F., North Carolina State College, 1952; D.F., Duke University, 1955. (1955-)

†HODGDON, ALBION R., *Professor of Botany*
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B.S., University of New Hampshire, 1948; Ed.M., Boston University, 1949; Ph.D., University of Nebraska, 1953. (1954-)

JELLISON, CHARLES A., JR., *Instructor in History*
A.B., Stanford University, 1944; M.A., *ibid.*, 1948; Ph.D., University of Virginia, 1956. (1956-)

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JOHNSON, ARTHUR W., *Professor of Business Administration*
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JOHNSON, GIBSON R., *Associate Professor of History*
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JONES, PAUL R., *Assistant Professor of Chemistry*
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KARSON, SAMUEL, *Assistant Professor of Psychology*
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KAUPPINEN, TENHO S., *Associate Professor of Mechanical Engineering*
B.S., University of New Hampshire, 1939; M.S., *ibid.*, 1947. (1939-)

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B.A., University of British Columbia, 1948; M.A., *ibid.*, 1949; Ph.D., University of London, 1952. (1956-)

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KENNEDY, KEVIN B., *Assistant Agricultural Agent in Grafton County*
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KENNEDY, ROBERT C., *Associate Professor of Horticulture, Thompson School of Agriculture*
B.V.A., Massachusetts State College, 1940. (1941-)

KICHLINE, WILLIAM L., *Professor of Mathematics*
B.A., Lehigh University, 1924; M.S., *ibid.*, 1928. (1931-)

KILPATRICK, R. A., *Lecturer in the College of Agriculture*
B.S., Oklahoma A. & M. College, 1941; M.S., *ibid.*, 1949; Ph.D., University of Wisconsin, 1951. (1957-)

KIMBALL, HAROLD E., JR., *Riding Instructor, Department of Animal Science*
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KIMBALL, ROBERT O., *Assistant Professor of Mathematics*
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B.S., University of Rhode Island, 1951; M.S., Rutgers University, 1953; Ph.D., *ibid.*, 1956. (1956-)

KNAPP, DAVID C., *Assistant Professor of Government and Assistant to the President*
A.B., Syracuse University, 1947; A.M., University of Chicago, 1948; Ph.D., *ibid.*, 1953. (1953-)

KNOX, HARRY B., *Associate Club Agent in Rockingham County*
B.S., University of New Hampshire, 1950. (1954-)

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Kuivila, Henry G., *Professor of Chemistry*
B.S., Ohio State University, 1942; M.A., *ibid.*, 1944; Ph.D., Harvard University, 1948. (1948-)

Kunz, Frederick A., *Extension Associate Professor and Extension Specialist in Human Relations and Child Development*
B.A., Iowa Wesleyan College, 1952; M.A., State University of Iowa, 1953. (1956-)

Kuusisto, Allan A., *Associate Professor of Government*
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†Latimer, L. Phelps, *Associate Professor of Horticulture*
B.S., University of California, 1921; M.S., *ibid.*, 1922; Ph.D., *ibid.*, 1926. (1926-)

Laurent, John L., *Assistant Professor of The Arts*
B.F.A., Syracuse University, 1948; M.A.T., Indiana University, 1954. (1954-)

Lavine, Irvin, *Professor of Chemical Engineering*
B.S., University of Minnesota, 1924; Ph.D., *ibid.*, 1930 (1948-49, 1951-)

Lavoie, Marcel E., *Assistant Professor of Zoology*
B.A., St. Anselm's College, 1940; M.A., University of New Hampshire, 1950; Ph.D., Syracuse University, 1956. (1950-52, 1955-)

Leclerc, Norman G., *Instructor in Civil Engineering*
B.S., University of New Hampshire, 1957. (1957-)

Lee, William R., Jr., *Assistant Professor of Entomology*
B.S.A., University of Arkansas, 1952; M.S., University of Wisconsin, 1953; Ph.D., *ibid.*, 1956. (1956-)

Leighton, Charles H., *Instructor in Languages*
A.B., Harvard College, 1951; M.A., Harvard University, 1953. (1956-)

Leighton, Roger S., *County Forester in Belknap-Strafford Area*
B.S., University of New Hampshire, 1941. (1952-)

Lepke, Arno K., *Associate Professor of Languages*
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Littlefield, Ralph B., *Extension Agronomist and County Agent Leader*
B.S., University of New Hampshire, 1927. (1940-)

Lockwood, John A., *Associate Professor of Physics*
A.B., Dartmouth College, Thayer School of Engineering, 1941; M.S., Lafayette College, 1943; Ph.D., Yale University, 1948. (1948-)

Long, David F., *Associate Professor of History*
A.B., Dartmouth College, 1939; A.M., Columbia University, 1946; Ph.D., *ibid.*, 1950. (1948-)

†Loughlin, Margaret E., *Assistant Professor of Biochemistry*
A.B., Regis College, 1942; M.S., University of New Hampshire, 1953. (1951-)

Lucey, Robert F., *Assistant Professor of Agronomy*
B.V.A., University of Massachusetts, 1950; M.S., University of Maryland, 1954. (1958-)

Lundholm, Carl, *Director and Professor of Physical Education and Athletics*
B.S., New Hampshire College, 1921; M.A., Columbia University, 1939. (1928-)

LYLE, GLORIA G., *Instructor in Chemistry, Part-time*
B.A., Vanderbilt University, 1944; M.S., Emory University, 1946. (1951-)

LYLE, ROBERT E., JR., *Professor of Chemistry*
B.A., Emory University, 1945; M.S., *ibid.*, 1946; Ph.D., University of Wisconsin, 1949. (1951-)

MAHER, FREDERICK J., JR., *Instructor in Sociology*
B.A., Yale University, 1952. (1957-)

MANNS, MEREDYTH G., *Instructor in Music*
B. of Music in Voice, University of Michigan, 1955; M. of Music in Voice, *ibid.*, 1956. (1956-)

MANTON, ROBERT W., *Professor of Music*
Harvard University, 1918. (1923-)

MARSH, EVAMAE, *Home Demonstration Agent in Carroll County*
B.S., Nasson College, 1957. (1957-)

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MARSTON, PHILIP M., *Professor of History*
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MATTHEWS, LILLIAN B., *Extension Assistant Professor of Textiles and Clothing*
B.S., MacDonald College of McGill University, 1950; M.S., Pennsylvania State University, 1955. (1955-)

MAYNARD, MAX S., *Associate Professor of English*
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MCCARTHY, JOHN F., JR., *Instructor in English*
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MCDOUGALL, DONALD V., *Captain, United States Air Force, Instructor, Air Science*
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MCELROY, JOSEPH P., *Instructor in English*
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MCGRATH, WILLIAM E., *Plant and Animal Sciences Librarian*
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MCINTIRE, PAUL H., *Director of Testing and Placement*
B.A., University of New Hampshire, 1942; A.M., Boston University, 1945; Ed.D., *ibid.*, 1957. (1946-)

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B.A., Michigan State College, 1939; M.A., *ibid.*, 1950. (1955-)

MCLAUGHLIN, WINNIFRED, *Associate County Club Agent in Strafford County*
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B.S., University of New Hampshire, 1937; M.S., Rutgers University, 1941. (1948-)

MELVIN, DONALD W., *Instructor in Electrical Engineering*
B.S., University of New Hampshire, 1955; M.E., Yale University, 1957. (1957-)

Menge, Carleton P., *Associate Professor of Education*
B.S., Springfield College, 1939; M.A., University of Chicago, 1940; Ph.D., *ibid.*, 1948. (1948-)

Merritt, Richard D., *Assistant Professor of The Arts and University Photographer*
Rochester Institute of Technology, 1948. (1948-)

Metcalf, Theodore G., *Associate Professor of Bacteriology*
B.S., Massachusetts College of Pharmacy, 1940; Ph.D., University of Kansas, 1950. (1956-)

Meyers, T. Ralph, *Professor of Geology*
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Miller, Edmund G., *Assistant Professor of English*
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Mills, Betty Joyce, *Instructor in Physical Education for Women*
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Mooradian, Andrew T., *Assistant Professor of Physical Education and Athletics*
B.S., University of New Hampshire, 1948. (1950-)

Moore, George M., *Professor of Zoology*
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Mower, Lyman, *Assistant Professor of Physics*
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Mulhern, John E., Jr., *Assistant Professor of Physics*
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Murdoch, Joseph B., *Assistant Professor of Electrical Engineering*
B.S., Case Institute of Technology, 1950; M.S., University of New Hampshire, 1955. (1952-)

Myers, Norman W., *Treasurer*
B.S., University of New Hampshire, 1950. (1953-)

Nagle, John W., *Instructor in Physics*
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Newman, Barbara K., *Associate Professor of Physical Education for Women*
B.S., Russell Sage College, 1939; M.Ed., St. Lawrence University, 1948. (1948-)

Nichols, Nicholas P., *Instructor in English*
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Nicoloff, Philip L., *Instructor in English*
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Nissen, Harriet J., *Home Demonstration Agent in Hillsborough County*
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Nothmann, Gerhard S., *Consulting Psychiatrist*
M.D., University of Bern, 1938. (1952-)

Nulsen, William B., *Professor of Electrical Engineering*
B.S., California Institute of Technology, 1918; M.S., University of New Hampshire, 1930. (1926-)

O'Connell, Elias M., *Instructor in Mechanical Engineering*
Graduate, Wentworth Institute, course in forging, hardening and tempering, 1923; Graduate, two-year course in pattern making, *ibid.*, 1925. (1925-)

Olney, Austin L., *Assistant Director of the University Extension Service, in charge of Extension Courses, Extension Associate Professor of Education, and Specialist in Audio-Visual Education*
B.S., Central Michigan College of Education, 1937; M.Ed., University of Vermont, 1946. (1946-)

Olson, E. William, *Associate Professor of Physical Education and Athletics*
B.S., Boston University, 1940; M.S., University of Wisconsin, 1950. (1956-)

Olsson, Gunnar B., *Extension Assistant Professor of Dairy Science*
B.S., New Hampshire College, 1922. (1944-)

O'Reilly, John B., *Instructor in The Arts*
B.F.A., Syracuse University, 1952; M.F.A., School of The Arts Institute of Chicago, 1956. (1956-)

Osborne, David G., Jr., *Instructor in English*
A.B., New England School of Theology, 1952. (1957-)

Owen, Allan, *Assistant Professor of Music*
B.M., Cincinnati Conservatory of Music, 1950; M.M., *ibid.*, 1950. (1950-)

Owen, Margaret, *Order Librarian*
A.B., Mount Holyoke College, 1919. (1943-)

Owens, Robert H., *Assistant Professor of Mathematics*
B.S., Webb Institute of Naval Architecture, 1944; M.A., Columbia University, 1948; Ph.D., California Institute of Technology, 1952. (1956-)

Palmer, Stuart H., *Assistant Professor of Sociology*
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Parker, Clifford S., *Professor of Languages*
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PARTRIDGE, ALLAN B., *Associate Professor of History*
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PERCIVAL, GORDON P., *Research Associate Professor of Biochemistry*
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PERKINS, DONALD M., *Assistant Professor of Mathematics*
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PERKINS, VINCENT A., *Club Agent in Sullivan County*
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PERRY, ERROL C., *Assistant Professor of Farm Management, Thompson School of Agriculture*
B.S., Massachusetts State College, 1920. (1929-42, 1946-)

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B.S., Kansas State College, 1948; M.S., Purdue University, 1950. (1957-)

PETRARCA, ANTHONY E., *Instructor in Chemistry*
B.Ed., Rhode Island College of Education, 1953; M.S., University of Rhode Island, 1955. (1955-)

PETTIBONE, MARIAN H., *Assistant Professor of Zoology*
B.S., Linfield College, 1930; M.S., University of Oregon, 1932; Ph.D., University of Washington, 1947. (1953-)

PHIPPS, ROBERT H. K., *County Forester in Coos County*
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PILAR, FRANK L., *Assistant Professor of Chemistry*
B.S., University of Nebraska, 1951; M.S., *ibid.*, 1953; Ph.D., University of Cincinnati, 1957. (1957-)

†PLATTS, FRANCES E., *Assistant Professor of Home Economics*
B.S., University of New Hampshire, 1933; M.Ed., *ibid.*, 1941. (1945-)

POWERS, WILLIAM R., *Captain, United States Air Force, Instructor in Air Science*
B.S., University of New Hampshire, 1951. (1955-)

†PRINCE, ALLAN B., *Associate Professor of Agronomy*
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PRITCHARD, HUGH, *Reference Librarian*
B.A., University of Washington, 1939; M.A., University of North Carolina, 1942; M.S., Columbia University, 1950. (1954-)

PROCTOR, CHARLES A., *Club Agent in Belknap County*
B.S., University of Vermont, 1950. (1952-)

PURDY, JEAN V., *Instructor in Home Economics*
B.S., Cornell University, 1956; M.S., *ibid.*, 1957. (1957-)

PURINGTON, JAMES A., *Agricultural Agent in Rockingham County*
B.S., New Hampshire College, 1916; M.S., Massachusetts Agricultural College, 1920. (1920-)

RAND, M. ELIZABETH, *Associate Professor of Home Economics*
A.B., Wheaton College, 1930; M.Ed., Boston University, 1946. (1948-)

RASMUSSEN, EDWIN J., *Extension Professor of Horticulture*
B.S., University of Wisconsin, 1927; M.S., *ibid.*, 1929. (1929-36, 1947-)

REDFERN, LEO F., *Instructor in Government*
B.A., University of New Hampshire, 1950; M.A., *ibid.*, 1951; M.P.A., Harvard University, 1954; Ph.D., *ibid.*, 1958. (1957-)

REED, JOHN F., *Dean of the Graduate School, Professor of Botany, Coordinator of Research, and Special Assistant to the President*
A.B., Dartmouth College, 1933; M.A., Duke University, 1935; Ph.D., *ibid.*, 1936. (1956-)

†RICH, AVERY E., *Professor of Botany*
B.S., University of Maine, 1937; M.S., *ibid.*, 1939; Ph.D., State College of Washington, 1950. (1941-43, 1950-)

RICH, WAYNE S., *Club Agent in Merrimack County*
B.S., University of Maine, 1934. (1946-)

†RICHARDS, MATHIAS C., *Associate Dean of the College of Agriculture and Professor of Botany*
B.S., Utah State Agricultural College, 1932; Ph.D., Cornell University, 1938. (1941-)

RICHARDS, TUDOR, *Forester in Cheshire and Sullivan Counties*
A.B., Harvard College, 1934; B.S.F., University of Michigan, 1952. (1954-)

RICHARDSON, EDYTHE T., *Professor of Zoology*
B.S., New Hampshire College, 1922; M.S., University of New Hampshire, 1924. (1922-)

RICHARDSON, JOHN C., *Assistant Professor of English*
A.B., Dartmouth College, 1941; M.A., Columbia University, 1942. (1946-)

†RINGROSE, RICHARD C., *Professor of Poultry Science*
B.S., Cornell University, 1932; Ph.D., *ibid.*, 1936. (1942-)

†RISLEY, EDWARD B., *Assistant Professor of Horticulture*
B.S., Massachusetts State College, 1946; M.S., University of New Hampshire, 1955. (1948-)

ROBINSON, FREDERICK J., *Assistant Professor of Mathematics*
B.S., University of New Hampshire, 1949; M.A., *ibid.*, 1955. (1949-)

ROPER, ELIZABETH R., *Club Agent in Carroll County*
B.A., University of New Hampshire, 1928. (1928-)

ROSEN, SAM, *Associate Professor of Economics*
A.B., University of Wisconsin, 1942; A.M., Harvard University, 1948; Ph.D., *ibid.*, 1952. (1957-)

ROSS, SHEPLEY L., *Assistant Professor of Mathematics*
A.B., Boston University, 1949; A.M., *ibid.*, 1950; Ph.D., *ibid.*, 1953. (1955-)

ROUTLEY, DOUGLAS G., *Assistant Professor of Biochemistry*
B.S.A., University of British Columbia, 1952; M.S., Pennsylvania State University, 1953; Ph.D., *ibid.*, 1957. (1957-)

RUTHERFORD, RICHARD, *Agricultural Agent in Grafton County*
B.S., University of New Hampshire, 1940. (1941, 1948-)

SACKETT, EVERETT B., *Dean of Students and Professor of Education*
B.A., Hamline University, 1923; M.A., University of Minnesota, 1925; Ph.D., Columbia University, 1931. (1938-)

SAGE, NATHANIEL M., JR., *Assistant Professor of Geology*
S.B., Massachusetts Institute of Technology, 1941; S.M., *ibid.*, 1951; Ph.D., *ibid.*, 1953. (1955-)

SANDERS, LEIGHTON A., *Assistant Director of the University Health Service*
B.S., University of Vermont, 1928; M.D., *ibid.*, 1932. (1954-)

Sargent, Leslie B., Jr., *Forester in Grafton County*
B.S., University of New Hampshire, 1943. (1954-)

Savidge, Alice H., *Reference Librarian, Part-time*
A.B., Bucknell University, 1940; M.A., University of Denver, 1956. (1957-)

Sawyer, Albert K., *Assistant Professor of Chemistry*
A.B., Colby College, 1940; M.S., University of Maine, 1947. (1949-)

Sawyer, Philip J., *Assistant Professor of Zoology*
B.S., University of New Hampshire, 1940; M.S., *ibid.*, 1948; Ph.D., University of Michigan, 1956. (1952-)

Schaefer, Paul E., *Associate Dean of the College of Liberal Arts and Associate Professor of Zoology*
A.B., Bethany College, 1926; M.S., Ohio State University, 1931; Ph.D., *ibid.*, 1936. (1941-)

Scheier, Edwin, *Associate Professor of The Arts*
Art-student League, 1928-30; New York School of Industrial Art, 1929-31. (1940-)

Schneer, Cecil J., *Assistant Professor of Geology*
A.B., Harvard University, 1943; A.M., *ibid.*, 1949; Ph.D., Cornell University, 1954. (1949, 1954-)

Schreiber, Richard W., *Assistant Professor of Botany*
B.S., University of New Hampshire, 1951; M.S., *ibid.*, 1952; Ph.D., University of Wisconsin, 1955. (1957-)

Schultz, J. Howard, *Associate Professor of English*
B.A., University of Texas, 1933; M.A., *ibid.*, 1934; M.A., Harvard University, 1939; Ph.D., *ibid.*, 1940. (1946-)

Sciarappa, Alfred J., *Captain, United States Air Force, Instructor in Air Science*
B.B.A., Northeastern University, 1950. (1955-)

Seiberlich, Joseph, *Research Associate Professor, Engineering Experiment Station*
Diploma Ingenieur, Technical University, Karlsruhe, Germany, 1924; Doctor Ingenieur, *ibid.*, 1928. (1941-)

Sewell, Charles A., *Instructor in Mathematics*
B.S., University of New Hampshire, 1929; M.S., *ibid.*, 1932. (1946-51, 1957-)

Shafer, Joseph E., *Professor of Economics*
B.S., DePauw University, 1925; M.A., University of Wisconsin, 1929; Ph.D., *ibid.*, 1932. (1946-)

Shanken, Edward D., *Assistant Extension Director in charge of Conferences and Institutes and Extension Instructor in Speech*
B.A., Pennsylvania State University, 1952; M.A., *ibid.*, 1953. (1954-)

Shaw, J. Gordon, Jr., *Assistant Professor of Sociology*
B.A., Northwestern University, 1947; M.A., *ibid.*, 1948; Ph.D., University of Washington, 1954. (1954-)

Sherry, William M., *Instructor in Physics*
B.S., Boston College, 1955; M.S., University of New Hampshire, 1957. (1957-)

†Shimer, Stanley R., *Professor of Biochemistry*
B.S., Muhlenberg College, 1918; M.S., Pennsylvania State College, 1923. (1924-)

Sinnott, Edmund W., *Lecturer in Residence* (Second Semester, 1957-58)
Emeritus Dean of Yale University Graduate School; Director of Sheffield Scientific School; and Sterling Professor of Botany at Yale.

Skelton, Russell R., *Professor of Civil Engineering*
B.S., Purdue University, 1924; C.E., *ibid.*, 1934; S.M., Harvard University, 1939. (1928-)

†Skoglund, Winthrop C., *Professor of Poultry Science*
B.S., University of New Hampshire, 1938; M.S., Pennsylvania State College, 1940. (1950-)

†Slanetz, Lawrence W., *Professor of Bacteriology*
B.S., Connecticut State College, 1929; Ph.D., Yale University, 1932. (1932-)

Sloan, Roger P., *Extension Forester, ASC Projects*
B.S., University of New Hampshire, 1942. (1946-)

Small, Richard L., *Assistant Professor of Business Administration*
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†Smith, Anna M., *Professor of Home Economics*
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Smith, Clark, *Captain, Instructor in Military Science and Tactics*
B.S., United States Military Academy, West Point, 1950. (1956-)

Smith, David M., *Assistant Professor of Music*
Ed.B., Northern Illinois State Teachers College, 1939; M.A., Teachers College, Columbia University, 1947; Ed.D., *ibid.*, 1952. (1952-)

Smith, Gardner P., *County Agent in Coos County*
B.S., University of New Hampshire, 1952. (1955-)

*†Smith, Gerald L., *Assistant Professor of Animal Science*
B.S., University of New Hampshire, 1948; M.S., Pennsylvania State College, 1951. (1948-)

*†Smith, William W., *Associate Professor of Horticulture*
B.S., University of New Hampshire, 1924; M.S., *ibid.*, 1929; Ph.D., Michigan State College, 1935. (1936-)

Snively, A. Barr, Jr., *Assistant Professor of Physical Education and Athletics*
B.S., Princeton University, 1923; M.A., Columbia University, 1941. (1953-)

Solt, Marvin R., *Professor of Mathematics*
B.S., Lehigh University, 1918; M.S., *ibid.*, 1925. (1926-)

Spiller, Jack W., *Major, Assistant Professor of Military Science and Tactics*
B.S., United States Military Academy, 1941. (1957-)

Squires, Samuel I., *Instructor in Education*
A.B., Boston University, 1949; Ed.M., *ibid.*, 1954; Ed.D., *ibid.*, 1956. (1956-)

Stajdohar, Ralph E., *Instructor in Physics*
B.S., Bradley University, 1953; M.S., University of New Hampshire, 1955. (1956-)

Starbuck, James H., *Colonel, Professor of Air Science*
B.S., University of Vermont, 1939. (1956-)

Starke, Raymond R., *Professor of Hotel Administration*
A.B., Boston University, 1921; A.M., Harvard University, 1926. (1921-24, 1926-)

Steele, Donald E., *Associate Professor of Music*
B.M., New England Conservatory of Music, 1946; M.A., Colorado College, 1952. (1946-)

STEIN, HOWARD, *Instructor in English*
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B.S., New Hampshire College, 1917; M.F., Yale University, 1926; Ph.D., *ibid.*, 1930. (1919-)

STEVENS, ROBERT A., *Assistant Agricultural Agent in Rockingham County and Extension Specialist in Older Youth Work*
B.S., University of New Hampshire, 1937. (1955-)

STEWART, GLENN W., *Assistant Professor of Geology*
B.S., University of New Hampshire, 1935; M.S., Syracuse University, 1937. (1938-39, 1941-)

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B.S., University of New Hampshire, 1940; M.Ed., *ibid.*, 1944. (1942-)

STOLWORTHY, E. HOWARD, *Professor of Mechanical Engineering*
B.S., Tufts College, 1922. (1922-)

STONE, JOAN T., *Assistant Professor of Physical Education for Women*
B.S., Trenton State Teachers College, 1948; M.A., Montclair State Teachers College, 1955. (1954-)

*†STROUT, RICHARD G., *Instructor in Poultry Science*
B.S., University of Maine, 1950; M.S., University of New Hampshire, 1954. (1954-)

†SWAIN, LEWIS C., *Professor of Forestry*
B.S., New Hampshire College, 1918; M.F., Harvard University, 1929. (1927-)

SWAN, EMERY F., *Associate Professor of Zoology*
B.S., Bates College, 1938; Ph.D., University of California, 1942. (1952-)

SWASEY, HENRY C., *Associate Professor of Physical Education and Athletics*
B.S., Amherst College, 1915; M.S., Indiana University, 1941. (1921-)

SWEET, PAUL C., *Professor of Physical Education and Athletics*
B.S., University of Illinois, 1923; M.A., University of Southern California, 1941. (1924-)

TALBOT, NANCY H., *Instructor in Occupational Therapy*
B.S., University of New Hampshire, 1954. (1956-)

TAYLOR, NORMA L., *County Club Agent in Cheshire County*
B.S., University of New Hampshire, 1957. (1957-)

†TEERI, ARTHUR E., *Professor of Biochemistry*
B.S., University of New Hampshire, 1937; M.S., *ibid.*, 1940; Ph.D., Rutgers University, 1943. (1938-40, 1943-)

THAMES, SARAH, *Associate Professor of Home Economics and Manager and Dietitian, University Dining Hall*
B.S., Simmons College, 1930; M.A., Teachers College, Columbia University, 1942. (1945-)

THOMAS, ELIZABETH H., *Assistant Loan Librarian*
B.A., Smith College, 1941; M.S., Catholic University of America, 1956. (1956-)

THOMAS, GEORGE R., *Professor of The Arts*
B.Arch., Carnegie Institute of Technology, 1930. (1930-)

THOMPSON, JAMES L., *Captain, Instructor in Air Science*
Westchester State Teachers College, 1957-)

THOMPSON, WILBUR E., *County Forester in Merrimack County*
B.S., University of New Hampshire, 1927. (1945-)

Thorpe, Harry A., *Instructor in Electrical Engineering, Part-time*
B.S., University of New Hampshire, 1949. (1956-)

Tirrell, Loring V., *Professor of Animal Science*
B.S., Massachusetts Agricultural College, 1920; M.S., Massachusetts State College, 1941. (1921-25, 1930-)

Towle, Carroll S., *Professor of English*
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Travis, Dorothy F., *Assistant Professor of Zoology*
B.S., George Washington University, 1945; A.M., Radcliffe College, 1950; Ph.D., *ibid.*, 1951. (1953-)

Turner, Harry J., *Lecturer in Zoology*
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Turnquist, Harriet Clark, *Home Demonstration Agent in Belknap County*
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Underwood, Russell E., *Extension Associate Economist in Marketing*
B.S., Pennsylvania State College, 1918. (1948-)

Valentine, Russell L., *Assistant Professor of Mechanical Engineering*
Certificate in Machine Design, Wentworth Institute, 1942; B.S., Michigan State College, 1951; M.S.M.E., Purdue University, 1953. (1953-)

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B.S., University of New Hampshire, 1937; B.S.F., University of Michigan, 1938; M.F., *ibid.*, 1947; Ph.D., *ibid.*, 1954. (1953-)

Wallace, William H., *Assistant Professor of Geography*
B.S., Beloit College, 1948; M.S., University of Wisconsin, 1950; Ph.D., *ibid.*, 1956. (1957-)

Walsh, John S., *Professor of Languages*
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Warren, Richard, *Extension Professor of Poultry Science*
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Webber, Laurance E., *Research Associate Professor and Assistant Director, Engineering Experiment Station*
B.S., University of New Hampshire, 1934; M.E., *ibid.*, 1940; M.S., *ibid.*, 1946. (1937-)

Webber, Carl P., *Assistant County Forester in Belknap County*
B.S., University of New Hampshire, 1955. (1957-)

Webster, Karl A., *Assistant Professor of Mechanical Engineering*
B.S., University of Vermont, 1949. (1957-)

Webster, Robert G., *Professor of English*
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B.S., Cornell University, 1937. (1954-)

Wellman, Bertram, *Assistant Professor of Electrical Engineering, Part-time*
B.S., Harvard, 1924; M.S., Masschusetts Institute of Technology, 1937. (1957-

Weston, Ruth C., *Associate State Club Leader, Cooperative Extension Service*
B.A., New Hampshire College, 1921; M.Ed., University of Maryland, 1953. (1929-)

Wheeler, Charles M., Jr., *Associate Professor of Chemistry*
B.S., West Virginia University, 1947; M.S., *ibid.*, 1949; Ph.D., *ibid.*, 1951. (1950-)

Whippen, Norman F., *Extension Associate Marketing Specialist and County Agent-at-Large*
B.S., New Hampshire College, 1918. (1922-23, 1928-45, 1948-)

White, Ben O., Jr., *Captain, Instructor in Military Science and Tactics*
B.S., Mississippi State College, 1949. (1957-)

Wicks, John D., *Instructor in Music*
A.B., Harvard University, 1944; A.M., *ibid.*, 1947. (1956-)

Williamson, Phyllis D., *Instructor in Speech*
B.A., Louisiana State University, 1945; M.A., *ibid.*, 1953. (1957-)

Wilson, Helen S., *Extension Specialist in Gerontology*
A.B., University of Washington, 1925. (1956-)

Winn, Alden L., *Professor of Electrical Engineering*
B.S., University of New Hampshire, 1937; S.M., Massachusetts Institute of Technology, 1948. (1948-)

Wojtaszek, Florence P., *Instructor in Mathematics*
B.A., Hunter College, 1957. (1957-)

Woodruff, Ruth J., *Professor of Economics*
A.B., Bryn Mawr, 1919; A.M., *ibid.*, 1920; Ph.D., Radcliffe College, 1931. (1931-)

Wooster, Caroline S., *Associate Professor of Physical Education for Women*
Sargent School for Physical Education, 1926; B.S., University of New Hampshire, 1943. (1946-)

Wurts, Davis P., *Assistant Professor of Mechanical Engineering*
B.S., Bowdoin College, 1948; M.S.E., University of Michigan, 1956. (1955-)

†Yeager, Albert F., *Professor of Horticulture*
B.S., Kansas State College, 1912; M.S., Oregon Agricultural College, 1916; Ph.D., Iowa State College, 1936. (1939-)

Zimmerman, Oswald T., *Professor of Chemical Engineering*
B.S.E., University of Michigan, 1929; M.S.E., *ibid.*, 1931; Ph.D., *ibid.*, 1934. (1938-)

Administrative Staff

Angell, Guy, *Farm Superintendent*
Barnard, Dudley P., *Internal Auditor*
Bennett, Frederick J., *Alumni Fund Director*
Corrow, Henry W., Jr., *Extension Editor*
Curtis, Staton R., *Director of Memorial Union*
Ewart, John E., *Program Director, Memorial Union*
Fitz, Harry M., *Assistant Superintendent of Properties*
Freeman, Donald C., *Accountant, Business Office*
Henson, Dayton M., *Manager of Bookstore*
Josselyn, Dorothy, *Research Analyst I in Biochemistry*
King, Reginald W., *Manager of Printing Service*
Kougias, Georgia A., *Alumni Recorder*
Lavoie, Pauline, *Research Analyst II in Agronomy*
Lyford, Walter H., *Soil Surveyor*
Martling, W. Kent, *Assistant Treasurer*
Morse, Wallace J., *Research Analyst II in Entomology*
Muise, Benoit E., *Food Manager, Memorial Union*
Nason, Harriet B., *Supervising Nurse*
Paul, Ann C., *Research Analyst I in Dairy Science*
Plumer, Richard C., *News Editor*
Sanborn, Bessie G., *Research Analyst II in Agronomy*
Sanders, Marion G., *Head of Snack Bar and Assistant Food Manager, Memorial Union*
Sherman, Robert L., *Financial Aids Officer and Non-Academic Personnel Assistant*
Smith, Russell C., *Purchasing Agent*
Taylor, Wallace C., *Clerk-of-Works*
Titus, Chester R., *Manager of University Housing*
Wilcox, Philip A., *Manager of Poultry Farm*
Wolf, John, *Chief Accountant, Business Office*

House Directors

Adams, Inez P., Hetzel Hall
Chellis, Bertha C., Hunter Hall
Eastman, Josephine B., Scott Hall
Fifield, Pauline F., Congreve North
Foulkrod, Blanche M., Sawyer Hall
Gile, Olga B., Gibbs Hall
Grant, Amy M., Congreve South
Graves, Margery W., Engelhardt Hall
Hill, Helen C., East-West Halls
Hyde, Minna B., Alexander Hall
Lord, Janet S., Smith Hall
Penney, Lily C., Hostess, Commons Extension Center
Pettingill, Barbara F., Fairchild Hall
Priest, Ruth W., McLaughlin Hall
Riciputi, Remo H., Assistant to the Director, West Hall
Vlahakos, Dorothea J., Assistant to the Director, Congreve South

Methods of Admission

The University will admit without examination properly prepared New Hampshire students who are graduates of high schools or academies of New Hampshire which are approved by the State Board of Education, or those who are graduates of other accredited preparatory schools.

In-state applicants must have a scholastic record ranking in the upper two-fifths of the graduating class in order to be eligible for admission without examination.

The number of out-of-state students admitted each year is limited by law to a small proportion of the entering class. Selection of out-of-state candidates is made primarily on the basis of superior academic achievement in secondary school, but such traits as character, leadership, and initiative will be taken into account. Out-of-state applicants are expected to submit the results of the College Board Scholastic Aptitude Test.

Candidates for admission to the freshman class must show evidence that they are prepared in 15 units.

An entrance unit represents one course of four or five recitations a week for one year. It is assumed that two hours of shop or laboratory work are equivalent to one hour of classroom work.

Of the 15 units required, each applicant for admission into the freshman class must present at least 12 units in college preparatory subjects, including at least 3 units of English, 1 unit of natural science, and 1 in social studies.

University Undergraduate Dormitories

Hall	Date Built	Number of Rooms Single	Number of Rooms Double*	Rent per Student per Year Single	Rent per Student per Year Double
	Men				
Alexander	1951	13	64	$240.00	$220.00
College Road†	1947	4	26	165.00	145.00
East-West†	1918	1	116	165.00	145.00
Engelhardt	1946	22	42	195.00	175.00
Fairchild	1916‡	46	47	230.00	210.00
Gibbs	1946	22	42	195.00	175.00
Hetzel	1925	33	59	230.00	210.00
Hunter	1946	22	42	195.00	175.00
	Women				
Congreve North	1940	67	10	235.00	215.00
Congreve South	1920	61	47	225.00	205.00
Sawyer	1951	7	60	240.00	220.00
McLaughlin	1954	21	52	240.00	220.00
Scott	1932	49	36	230.00	210.00
Smith†	1908	13	28	180.00	160.00
New Hall	1958	9	55	240.00	220.00

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† Frame construction; Smith is brick veneered; East-West and Smith have automatic sprinklers. All other dormitories are fire-resistant.

‡ Renovated in 1951.

University Fees and Expenses

The following paragraphs summarize some of the pertinent information about fees and expenses. Complete information may be found in the *General Information* 1958-59 issue of the University Bulletin.

TUITION. Tuition for each semester is payable in advance.

The charge for tuition is $300 per year for residents of New Hampshire and $700 for non-residents.* Refundable deposits may be required to cover loss or breakage in certain departments. A charge will be made for individual lessons in music, as noted in the description of Applied Music courses. A charge will be made for riding lessons, as noted in the section on Physical Education for Women.

Any student who registers for 8 credits or more per semester shall pay the full tuition. Any student, regardless of state of residence, registering for fewer than 8 credits shall pay $12 per credit hour.

CHANGES IN RATES. The University reserves the right to adjust charges for such items as tuition, board, and room rent from time to time, Such changes will be held to a minimum and will be announced as far in advance as feasible.

DEPOSITS. A deposit of $15 is required of each student to whom military equipment is issued. Every student participating in the program of Physical Education and Athletics for Men and Physical Education for Women is required to deposit $1 for a locker and towel service, of which 25 cents a semester is partial compensation for towel service.

STUDENT ACTIVITY TAX. This tax must be paid by each undergraduate. It was $22 in 1957-58, of which $12 was a Memorial Union assessment.

ROOMS. *Students living in University dormitories are required to execute room contracts covering the college year.*

A ten dollar ($10.00) room deposit must accompany each application for a room. This deposit will be forfeited if the applicant fails to pay room rent by the stipulated date or cancels after that date. The deposit is held as a guarantee against breakage.

Room rent is payable in advance. For those attending the first semester, one-half of the year's rent must be paid not later than August 15. Rent for those attending the second semester must be paid not later than the last business day before the start of classes.

The room reservation or assignment will be cancelled if rent is not paid by the stipulated due date.

Rooms paid for and not occupied one day after registration day may be declared vacant and three-fourths of the room rent returned, unless the individual having the reservation makes a written request to the Manager of University Housing to hold the room until a later date. No room will be held for longer than 10 days after registration date.

An undergraduate woman student under 23 years of age is required to room in one of the women's dormitories or a sorority house, unless she is working for a room in a private home or living with her family.

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* Beginning in September, 1958, as part of the regional cooperation program of the New England Board of Higher Education, many non-residents from certain states will be eligible for tuition at the in-state rate in selected curricula, as follows: in Occupational Therapy, sophomores, juniors, seniors from all New England; in Hotel Administration, juniors and seniors from all New England; in Art and Art-Education, juniors and seniors from Maine, Massachusetts, Rhode Island, and Vermont; in Physical Education for Women, juniors and seniors from Massachusetts, Rhode Island, and Vermont.

The College of Agriculture

HAROLD C. GRINNELL, *Dean*
M. C. RICHARDS, *Associate Dean*

DEPARTMENTS

BIOCHEMISTRY
AGRICULTURAL ECONOMICS
AGRICULTURAL ENGINEERING
ANIMAL SCIENCE
AGRONOMY
BOTANY
DAIRY SCIENCE
ENTOMOLOGY
FORESTRY
HOME ECONOMICS
HORTICULTURE
POULTRY SCIENCE

GENERAL INFORMATION

The objective of the College of Agriculture is to give the student a fundamental education in the social and physical sciences and to provide specific technical training according to student interest in agriculture, forestry, or home economics. Classroom lectures and recitations are supplemented by laboratory work and field trips.

Some of our graduates obtain farms of their own and become successful and prosperous citizens of their communities. A majority find employment with state or government agencies, with commercial agricultural industries, or with farm cooperatives as managers, sales service, or technical personnel. An increasing number obtain additional education in preparation for specialized positions in teaching, research, and extension work.

The College of Agriculture offers the following degrees, depending on the student's field of specialization: Bachelor of Science in Agriculture. Bachelor of Science in Agricultural Engineering, Bachelor of Science in Forestry, and Bachelor of Science in Home Economics.

When a student enters the College of Agriculture as a candidate for the Bachelor of Science degree he selects his major field of study and is placed under the guidance of the Executive Advisory Committee which approves his program of study. A staff member in his major field is also assigned for consultation at any time during the freshman year.

At the time of registration for the sophomore year the student will be assigned to an adviser in his major field who then will be responsible for approving his program of study. Should a student elect to change his major field or study, a new adviser will be assigned.

The major curriculums from which the agricultural student may make his final choice follow. The College of Agriculture will be pleased to arrange courses of study for pre-theological, two-year pre-veterinary, and other students who desire a specialized program of study.

GENERAL AGRICULTURE
BIOCHEMISTRY
AGRICULTURAL ECONOMICS
AGRICULTURAL ENGINEERING
AGRONOMY
ANIMAL SCIENCE
BOTANY
DAIRY SCIENCE
ENTOMOLOGY
FORESTRY, including
    GENERAL FORESTRY
    FOREST GAME MANAGEMENT

Home Economics, including
  Clothing and Textiles
  Food, Nutrition, and
    Instructional Administration
  General Home Economics
  Teacher Preparation
Horticulture
Mechanized Agriculture
Poultry Science
Pre-Veterinary
Teacher Preparation in
  Agriculture

BACHELOR OF SCIENCE IN AGRICULTURE

GENERAL REQUIREMENTS

In order to qualify for a degree, each candidate must complete 136 semester credits, including the courses prescribed by his adviser or advisory committee, in one of the major four-year curriculums. He must achieve a grade point average of at least 1.8.

A student graduating from any of the four-year curriculums may be required by his major department to have sufficient practical experience to enable the department to recommend the student for a position.

No student may graduate from the College of Agriculture without a specific recommendation from his major department.

SPECIFIC REQUIREMENTS

During the freshman year nearly all students who are candidates for the Bachelor of Science degree in Agriculture pursue the same general outline of fundamental course work as listed below:

Freshman Year

All Curriculums	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
Physical Education 31, 32	½	½
Agriculture 1	1	
Botany 1	4	
Chemistry 1, 2, or 3, 4 (General)	4	4
Elective		3
English 1, 2	3	3
Mathematics 2, 3*	3	3
Zoology 48		3
	17	18

Sophomore Year

R.O.T.C.	1½	1½

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* Elective in certain departments.

ADDITIONAL MINIMUM REQUIREMENTS

In order to complete the requirements for the Bachelor of Science degree in Agriculture or Forestry, a student must obtain, in addition to the required freshman work, additional credits in each of several areas as noted below.

These minimum requirements covering the four years of study follow:

*Biological Sciences (Bacteriology, Botany, Zoology, Entomology 2, Entomology 41)	3
*Chemistry (Biochemistry, or Chemistry)	5
Economics 1	3
Economics, Agricultural Economics, or Forest Economics 44, for Forestry majors	3
English	5
Physics	4
Social Sciences (Government, History, Psychology, Sociology, Education 41, 42, 52)	6
Total	29

CURRICULUMS

General Agriculture

This curriculum is offered for the student who wishes to secure a broad, general training in several important branches of agriculture without specializing in any particular department. A wider choice of subject matter is available here than in the more specialized curriculums.

Students who expect to farm will find this curriculum, with it wide range of fundamental and practical courses, a most profitable one. This curriculum also aims to prepare the student for agricultural extension work, such as a county agent, a boys' and girls' club leader, or a farm manager. For those expecting to specialize later in graduate work, the broad foundation of fundamental subject matter made possible by this curriculum provides a desirable background.

Biochemistry

Students majoring in this curriculum receive training in the various branches of general chemistry and in their application to the growth and development of plants and animals. The methods used in the chemical analysis of plants and agricultural products and in the study of animal nutrition and metabolism are given special attention. The curriculum is designed to provide a thorough foundation for those expecting to prepare themselves for teaching and research in agricultural colleges and experiment stations or for technical positions in industry related to agriculture. A freshman who wishes to major in this department should take Chemistry 3-4 and also Mathematics if his high-school preparation is adequate.

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* Waived as College requirements for majors in Agricultural Economics.

As this is a professional and specialized field, entrance to it at the beginning of the sophomore year, and continuance in it, are conditioned by a satisfactory record. An early conference with the chairman of the department is imperative.

Agricultural Economics

The curriculum in Agricultural Economics is designed to meet the needs of three groups of students under the following options:

1. *Farm Management.* Preparation in modern agriculture leading to careers in farm managing; in research, teaching, and extension work; and in service work with public and private credit and conservation agencies. This option provides training in the economics of farm production and resource conservation, in methods of analyzing, and solving farm business problems, and in scientific agriculture.
2. *Agricultural Marketing.* Preparation for specialized research and teaching careers in the economics of marketing farm products, and in market analysis and development work with private firms. The student's training will include marketing research and analysis methods, economic theory, and techniques of processing and distribution.
3. *Agricultural Business Management.* Preparation for business careers with companies engaged in processing and marketing agricultural products, handling supplies and services used by farmers, and wholesale and retail distribution. Emphasis is placed on learning modern business practices to supplement training in agriculture and economics.

The student in Agricultural Economics is trained primarily in the science of economics and in the application of economics to problems in farm management, food marketing, agricultural price policy, use and conservation of natural resources, world food supply, and rural sociology. In addition, students majoring in this field will obtain a sound background in scientific farming from courses in agricultural production. The student is also encouraged to take courses contributing to a broad university education.

The courses in Agricultural Economics are complementary with those offered by other departments in the College and are in part designed to help major students in other fields gain knowledge about economics related to agriculture.

Agricultural Engineering

Candidates for the degree of Bachelor of Science in Agricultural Engineering will refer to the Agricultural Engineering Curriculum on page 53. Candidates for the Bachelor of Science degree with a major in Mechanized Agriculture will refer to Mechanized Agriculture on page 50.

Agronomy (Soils and Farm Crops)

Persons trained in Agronomy are qualified to take Federal Civil Service examinations to enter the field crops, soil science, or soil conservation positions in the United States Department of Agriculture. Positions in research and teaching are also available to those with advanced training in Agronomy. The agricultural extension service, as well as seed, feed, and fertilizer companies, employ graduates who have majored in Agronomy.

Courses offered in Agronomy provide an opportunity for the student to specialize in Soil Science or Crop Science. Students majoring in these fields must complete a minimum of 21 credits in Agronomy. Those who specialize in Soil Science may find employment in many fields, such as in soil conservation, soil classification and mapping, soil physics, soil chemistry, soil microbiology, and soil fertility. Those who specialize in Crop Science will be qualified for employment in crop production and management, plant breeding, and in related fields.

Well-equipped laboratories and greenhouse facilities are provided for students; also, opportunities are available to study nearby field experiments.

Animal Science

This curriculum is offered to students who wish specialized training in the intelligent and practical selection, breeding, feeding, and management of horses, sheep, swine, and beef and dual-purpose cattle.

It provides basic knowledge and training for managing livestock farms, and prepares students for production and sales work with feed concerns and packing plants. Many graduates enter the field of agricultural extension work as specialists and as county agricultural agents. The subject matter is basic in preparation for graduate work in Animal Science.

A course in meat and meat products is included. Some cultural subjects are required. Students are permitted to elect subjects in line with their capabilities and inclinations.

The department maintains purebred herds of Milking Shorthorn, Aberdeen Angus, and Hereford cattle; Yorkshire swine; flocks of Dorset and Shropshire sheep; and Morgan horses.

Botany

Students interested in a broad background in the plant sciences should consider majoring in Botany. The principal fields of concentration in Botany are: (1) Pathology — the study of plant diseases, their causes and control; (2) Physiology — the study of plant functioning with such practical applications as plant nutrition and other requirements for plant growth; (3) Taxonomy — plant classification and plant identification; (4) Ecology — which concerns the relationship of the plant to its environment; (5) Morphology and Anatomy — the study of the anatomy, development, and cellular organization of plants, including histological techniques; (6) Cytology — the cell, cytological techniques, and chromosome studies; (7) Preparation for botanical technicians; and (8) Preparation for secondary-school teaching.

The undergraduate courses to be taken in all these fields are nearly the same until the junior and senior years. Some specialization should then be made. The student who graduates in Botany may take graduate work in Botany or in the related fields of Horticulture, Forestry, and Agronomy which require an extensive background in Botany. Assistantships, research positions, and full-time teaching jobs are more available at present than in previous years. Opportunities for able botanists also occur in government work. Positions as technicians or secondary school teachers may be obtained with a B.A. or B.S. degree.

Dairy Science

The Dairy Science curriculum is designed to offer fundamental scientific training in (1) dairy production and (2) dairy technology.

Outstanding graduates from both of these curriculums are qualified to pursue advanced study in preparation for college teaching, research positions in industry and agricultural experiment stations, and specialized technical positions in federal and state agencies.

In dairy production the program of study offers preparation for opportunities in (1) technical positions in the feed industry, in the farm equipment industry, and in breed and breeding organizations; (2) positions in public service with state and federal agencies; (3) dairy farming.

Training in dairy technology prepares students for executive and administrative positions in the dairy processing industry. It also prepares for plant and laboratory positions in milk processing plants, and for inspectors of dairy products and dairy establishments in federal, state, and municipal service.

The University dairy herd, together with the daily operations in the market milk, pasteurizing, and ice cream units at the Dairy Building, contribute to the practical training of students in any one of several lines of the dairy industry.

The Dairy Science Laboratories, located in the Dairy Building and in the Dairy Barn, are equipped for instructional purposes. The equipment includes pasteurizers, coolers, ice cream freezer, bottler, refrigeration units, homogenizer, and a soaker-type bottle washer. The milk-testing and bacteriological laboratories are equipped for chemical and bacteriological analyses of dairy products.

Entomology

The Department of Entomology offers various courses for students who wish to specialize in the study of insect life, insect control, apiculture, and insects in relation to man. There are many fields open to those qualified in Entomology. There are opportunities for employment in public institutions and organizations, and in addition, there are many opportunities for employment with commercial and industrial firms which frequently employ college graduates who have majored in this field of study.

Students who desire a broad fundamental training in Entomology and related fields will follow the program outlined as General Entomology. Those who wish to specialize in chemical control of insects, and who plan to take graduate work leading to a professional degree in that field, will follow a program outlined as Insect Toxicology. These students will be expected to take considerable mathematics and chemistry.

Students planning a career in Entomology are urged to consult with their adviser in regard to the selection of electives best suited to their needs.

Horticulture

Conditions of climate, soil, and market combine to make New Hampshire a state with great horticultural possibilities. Accordingly, the Department of Horticulture, with its excellent facilities and staff, offers instruction in three major fields: Pomology (fruit growing), Vegetable Crops, and Ornamental Horticulture, with particular emphasis on floriculture, propagation, and greenhouse management.

Students who graduate with a major in Horticulture will have received the liberal training expected of a university graduate, a thorough preparation in the fundamental sciences underlying plant production, adequate training in general horticulture, and, finally, some specialization in the field chosen. The courses are designed to acquaint the student with the problems of the improvement, production, and marketing of fruits, vegetables, plants, or flowers. The training is such that superior students can pass the Federal Civil Service examinations required for entrance into positions with the United States Department of Agriculture or find positions in research, teaching, or state agricultural extension services. It is usually expected that students will take graduate work if they intend to enter the professional field. University of New Hampshire graduates with a good scholastic record have had little difficulty in securing fellowships or scholarships in other colleges and universities.

Major students in the Department must elect a minimum of 11 semester credits in Advanced Horticulture and related courses, in addition to Horticulture 2, 13, 91, 92, and 94, required of all majors. A special effort is made to see that outside work during the college year and work done during the vacation periods will provide sufficient practical experience before a student graduates, so that he has more than a theoretical knowledge of his profession. The extensive University orchards, gardens, and greenhouses are used as laboratories.

Mechanized Agriculture

The Mechanized Agriculture curriculum is offered by the Department of Agricultural Engineering. This curriculum is designed to provide instruction and training in the fundamentals of agricultural science with particular emphasis on the technical phases of operating a farm. The program of study prepares men for self-employment as farm operators and for commercial positions in the agricultural industry.

Students completing this curriculum may find employment selling or servicing agricultural building materials, labor-saving mechanical equipment, irrigation systems, tractors, and field machinery. Graduates are qualified for positions as agricultural extension workers, as soil conservationists with the Soil Conservation Service or as "rural use advisers" with electric utility companies. They may also find employment with farm insurance companies or agricultural management organizations.

As farming becomes more intensive and the mechanization of our farms more complete, there will be even greater opportunities for men with this type of training.

Poultry Science

The curriculum in Poultry Science has been designed to offer students fundamental and special training in the practical and professional fields of poultry.

The program of study prepares students for various lines of work, such as production, sales, and service with feed and equipment manufacturing concerns; marketing organizations handling poultry and eggs; commercial hatcheries; poultry-farm managers, as well as for the operation of their own farms. By supplementing his undergraduate work with one or more years of graduate study, the superior student will find opportunities in the professional fields of teaching, agricultural extension, and research.

Major students will find a variety of courses offered in the department. In addition, selected courses in other departments of the College are required in support of, and as a supplement to, the instruction given in the department. However, the student elects these courses under guidance, and considerable latitude is offered. Special attention is given to the interests and ability of each student.

The department works closely with the New Hampshire poultry industry which ranks high among those in the country. In this connection, frequent and full discussion is given in the classroom to broad problems of the industry.

All the facilities of the University Poultry Farm are available for student instruction. This farm is stocked with both chickens and turkeys, and has modern equipment for carrying on its work.

Pre-Veterinary

Students who contemplate veterinary medicine as a career should elect the Pre-Veterinary curriculum. Successful completion of this curriculum will meet the scholastic requirements for admission to an approved veterinary college. However, all veterinary colleges give first preference for admission to applicants from their respective states. The current number of applications for admission is tremendous. The few out-of-state students who will be admitted will necessarily have shown outstanding scholastic ability.

Although two years of pre-veterinary training will meet the requirements of most veterinary colleges, it is desirable for a person to spend four years in pre-veterinary work and complete the requirements for the Bachelor's degree. It is desirable that applicants to colleges of veterinary medicine have farm experience and, in fact, it is a prerequisite for admission to some.

Teacher Preparation

Under the provision of the Smith-Hughes Act, the University of New Hampshire has been designated as the institution in this state for the preparation of teachers of agriculture. Vocational Agriculture offers a fertile field for young men who desire to follow the profession of teaching. The work is varied and interesting with opportunities for wide community contacts through the all-day, young-farmer, and adult-farmer programs.

Agricultural teachers are encouraged to enter upon a program of graduate study as a means of professional growth. Successful completion of such study should result in greater opportunities for advancement in the field of agricultural education.

Due to the nature of the duties performed by the teacher of agriculture, it is essential for a student to acquire a good foundation in all the predominating agricultural enterprises of the state. His course of study, therefore, will follow a broad general program rather than a specialization in any one particular field. Furthermore, he must meet the state requirements for certification which include one semester of practice teaching, 14 additional credits of courses in Education, and 8 credits of Agricultural Engineering. In addition, the teacher must have farm upbringing prior to enrolling in Vocational Agriculture Teacher Training or two years of agricultural experience, one year of which must have been continuous in a standard commercial farm enterprise.

SUGGESTED PROGRAMS

Except for minor variations, the required freshman program is applicable to all agricultural students who are candidates for the Bachelor of Science degree. Military Science and Physical Education, which are general curriculum requirements, should be completed by the end of the sophomore and freshman years, respectively. Additional minimum requirements may be satisfied at any time prior to graduation but should be kept in mind when planning a schedule of courses for each semester during the sophomore, junior, and senior years. Beyond the freshman program, the general curriculum requirements of the College of Agriculture, a student will select the remainder of his program in consultation with the supervisor of his curriculum.

The following curriculums *suggest* plans of study applicable to most students but are not intended as lists of required courses. It is assumed that the program will vary according to the needs of the individual student. It should be remembered that a student must complete an average of 17 credits per semester in order to accumulate a total of 136 credits in four academic years.

GENERAL AGRICULTURE

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
Agron. 1, 14, *Introductory Crop Production, Soil Fertility*	3	3
Agron. 11, *Introductory Soils*	4	
Biochem. 1, *Organic and Biological*	5	
Ag. Eng. 17, 18, *Farm Shop*	2	2
Ag. Eng. 21, *Soil and Water Conservation*	2	
An. S. 2, *Types and Market Classes*		3
Hort. 4, *Introductory Horticulture*		3
Py. S. 2, *Farm Poultry*		3
Social Science		3
	16	17

JUNIOR YEAR		
An. S. 11, *Livestock Judging*	1	
Ag. Econ. 14, *Farm Management*		4
Bot. 51, *Plant Pathology*	3	
Dy. S. 23, *Dairy Cattle*	3	
Econ. 1, *Principles of Economics*	3	
Engl. 35, *Public Speaking*	3	
Phys. (9), *Elementary Physics*		4
Zool. (61), *Genetics*		3
Social Science		3
Electives	3–4	3
	16–17	17

SENIOR YEAR		
Ag. Econ. 51, 60, *Cooperative Business, Agricultural Policy*	3	3
An. S. 13, *Feeds and Feeding*	3	
B. A. 1, 2, *Principles of Accounting*	3	3
Engl. 23, *Writing of Technical Reports*	2	
Ent. 41, *Insects of Orchard and Garden*	3	
For. 1, *Forestry Principles*	3	
Electives		9
	17	11–16

BIOCHEMISTRY

The following program of study assumes the completion in the freshman year of mathematics sufficient to serve as the prerequisite to calculus. Otherwise, additional mathematics would need to be included. Chemistry 3-4 is preferred to Chemistry 1-2 for freshmen.

Sophomore Year	First Semester Credits	Second Semester Credits
Agron. 11, 14, *Introductory Soils, Introductory Soil Fertility*	4	3
Bact. 1, *General Bacteriology*	4	
Bact. 2, 6, or 8, *Food and Sanitary Bacteriology, Soil Bacteriology, or Pathogenic Bacteriology*		4
Chem. 17, 26, *Introductory Quantitative and Qualitative Analysis*	4	4
Math. 17, 18, *Calculus*	3	3
Electives	2	3
	17	17

Junior Year		
Chem. 51-52, *Organic Chemistry*	5	5
Econ. 1-2, *Principles of Economics*	3	3
Lang. 1-2, *French or German*	3	3
Phys. 1-2, *Introductory Physics*	4	4
Electives	2	2
	17	17

Senior Year		
Biochem. 51-52, *Physiological Chemistry*	5	5
Biochem. 53-54, *Agricultural Analysis*	4	4
Engl. 35, *Public Speaking*	3	
Engl. (23), *Writing of Technical Reports*		2
Electives	5	6
	17	17

AGRICULTURAL ECONOMICS

This is the base curriculum required of all majors in Agricultural Economics. In addition, each major should select one of three optional fields of interest: Farm Management, Agricultural Marketing, or Agricultural Business Management: Supplementary courses for each option are given below.

Sophomore Year	First Semester Credits	Second Semester Credits
Gov. 1, *Principles of American Government*	3	
Phys. 9, *Elementary Physics*	4	
Econ. 1-2, *Principles of Economics*	3	3
Ag. Econ. 12, *Economics of the Agricultural Industry*		3
Electives	7	11
	17	17

Junior Year

Engl. 35, *Public Speaking*	3	
Ag. Econ. 55, *Agricultural Marketing*	3	
Econ. (31), *Economic and Business Statistics*		3
Ag. Econ. 14, *Farm Management*		4
Electives	11	10
	17	17

Senior Year

Engl. 23, *Writing of Technical Reports*	2	
Ag. Econ. 60, *Agricultural Policy*		3
Electives	15	14
	17	17

Optional Fields

FARM MANAGEMENT

Recommended: Ag. Econ. 54; Ag. Eng. 21; Agron. 1, 11; An. S. 13; B. A. 34; Dy. S. 5; Econ. 73; For. 1; Gov. (59); Hort. 4; Py. S. 2; Soc. 39. In addition, a minimum of 12 semester hours in social science courses.

AGRICULTURAL MARKETING

Recommended: Ag. Econ. 34, 51; Agron. 1; B. A. 46, 52; Dy. S. 65; Econ. 9, 25, 52; Py. S. 19; Psych. 1, 32. In addition, a minimum of 6 semester hours in social science courses and 6 semester hours in agricultural production courses.

AGRICULTURAL BUSINESS MANAGEMENT

Recommended: B. A. 1, 2, 21, 22, 34, 45; Econ. 25, 51, 52, 53; Psych. 1, 32; Soc. (43). In addition, a minimum of 12 semester hours in agricultural production courses.

AGRONOMY

(Soils and Farm Crops)

The Agronomy program will vary according to the special interest of the student. The courses listed below should be used as a guide for the student in working out a program in consultation with his faculty adviser.

Sophomore Year	*First Semester Credits*	*Second Semester Credits*
Biochem. 1, *Organic and Biological Chemistry*	5	
Agron. 1, *Introductory Crop Production*	3	
Agron. 11, *Introductory Soils*	4	
Agron. 14, *Introductory Soil Fertility*		3
Agron. 24 or 26, *Cereals and Other Grain Crops or Potatoes and Other Cash Crops*		3
Engl. (35), *Public Speaking*		3
Phys. 1 or (9), *Introductory or Elementary Physics*	4 or	4
Phys. 2, *Introductory Physics* or Bot. 2, *General Botany*		4
Social Science		3
Electives	1–5	
	17	16–20

JUNIOR YEAR

Agron. 24 or 26, *Cereals and Other Grain Crops or Potatoes and Other Cash Crops*		3
Agron. 28, *Forage and Pasture Crops*		3
Agron. 58, *Soil Classification and Mapping*		3
Agron. 59, *Soil Chemistry*	4	
Bact. 1, *General Bacteriology*	4	
Bact. 6, *Soil Bacteriology* or Bot. 56, *Plant Physiology*		4
Bot. 42, *Plant Ecology*		3
Econ. 1, *Principles of Economics*	3	
Geol. 7, *General Geology* or Ent. 41, *Insects of Orchard and Garden*	2 or	3
Zool. 61, *Genetics*	3	
	16–17	16

SENIOR YEAR

Ag. Econ. 14, *Farm Management*		4
Agron. 51, *Pasture-Hayland and Turf Management*	3	
Agron. 56, *Soil Physics*		3
Agron. 60, *Soil and Water Conservation*		3
Agron. 62, *Plant Breeding of Field Crops*		3
Agron. 71, 72, *Agronomy Seminar*	1	1
An. S. 13, *Feeds and Feeding*	3	
Bot. 51, *Plant Pathology*	3	
Engl. 23, *Writing of Technical Reports*	2	
Social Science	3	
Elective	2	3
	17	17

Other recommended electives are: Biochem. 2, *Plant Chemistry*; Ag. Eng. 21, *Soil and Water Conservation*; Agron. 25, *Seed Testing*; Bot. 53, *Plant Anatomy*; B. A. 45, *Principles of Selling*; Dy. S. 64, *Milk Production*; For. 1, *Forestry Principles*; For. 57, *Aerial Photogrammetry in Forestry*; Geol. 31, *Geomorphology*; Geol. 32, *Glacial Geology*; Hort. 53, *Pomology; Orchard Fruits*; Hort. 54, *Pomology: Small Fruit Culture*; C. E. 7, *Surveying*.

ANIMAL SCIENCE

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
Biochem. 1, *Organic and Biological Chemistry*	5	
Biochem. 4, *Animal Nutrition*		3
Agron. 1, *Introductory Crop Production*	1	
Agron. 11, *Introductory Soils*	4	
An. S. 18, *Meat and its Products; Livestock Markets*		2
Dy. S. 34, *Dairy Cattle Judging*		1
Phys. 9, *Elementary Physics*	4	
Py. S. 2, *Farm Poultry*		3
Electives	3	8
	17	17

JUNIOR YEAR

An. S. 11, 14, *Livestock Judging*	1	1
An. S. 13, *Feeds and Feeding*	3	
An. S. 15, 16, *Systematic Anatomy, Animal Diseases*	3	3
Bact. 1, *General Bacteriology*	4	
Econ. 1-2, *Principles of Economics*	3	3
Engl. (35), *Public Speaking*		3
Zool. (61), *Genetics*		3
Electives	3	4
	17	17

SENIOR YEAR

Ag. Econ. 14, *Farm Management*		4
An. S. 19, *Beef Cattle and Swine; Sheep*	3	
An. S. 21, *Light Horse Science*	2	
An. S. 51, 52, *Animal Breeding, Animal Science Seminar*	3	1–3
Dy. S. 23, *Dairy Cattle*	3	
Dy. S. 64, *Milk Production*		3
Dy. S. 65, *Market Milk*	3	
Engl. 23, *Writing of Technical Reports*	2	
Electives		7–9
	16	17

BOTANY

The Botany curriculum will vary according to the special interest of the student, whether Physiology, Pathology, Taxonomy, Morphology, Anatomy, Ecology, or Cytology.

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
Biochem. 1, 2, *Organic and Biological Chemistry, Plant Chemistry*	5	3
Bact. 1, *General Bacteriology*	4	
Bot. 6, *Systematic Botany*		3
Bot. 12, *Morphology of the Vascular Plants*		4
Econ. 1-2, *Principles of Economics*	3	3
Ger. 1-2, *Elementary German*	3	3
Electives	3	
	18	16

JUNIOR YEAR

Agron. 11, *Introductory Soils*	4	
Bot. 51, 42, *Plant Pathology, Plant Ecology*	3	3
Bot. 53, 56, *Plant Anatomy, Plant Physiology*	3	4
Engl. (35), *Public Speaking*		3
Phys. 1-2, *Introductory Physics*	4	4
Electives	3	
	17	17

SENIOR YEAR

Bot. 57, 58, *Investigations in Botany*	2–6	2
Bot. 59, 60, *Botany Seminar*	1	1
Engl. (23), *Writing of Technical Reports*		2
Electives	10–14	12
	17	17

Recommended electives for the Botany curriculum include: Hort. 2, *Plant Propagation;* Hort. 94, *Plant Breeding;* For. 26, *Wood Identification.*

DAIRY SCIENCE

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
Biochem. 1, 4, *Organic and Biological Chemistry, Animal Nutrition*	5	3
Agron. 11, *Introductory Soils*	4	
Agron. 1, *Introductory Crop Production*	3	
An. S. 11, 2, *Livestock Judging, Types and Breeds*	1	3
Dy. S. 33, 34, *Dairy Prolucts Judging, Dairy Cattle Judging*	1	1
Phys. (9), *Elementary Physics*		4
Electives	3	6
	17	17

JUNIOR YEAR

Agron. 14, *Introductory Soil Fertility*		3
An. S. 13, *Feeds and Feeding*	3	
An. S. 15, 16, *Systematic Anatomy, Animal Diseases*	3	3
Bact. 1, *General Bacteriology*	4	
Dy. S. 30, *Dairy Bacteriology*		4
Dy. S. 36, *Advanced Judging*		1
Econ. 1, *Principles of Economics*	3	
Engl. (35), *Public Speaking*		3
Zool. 61, *Genetics*	3	
Electives		3
	19	17

Senior Year

Ag. Econ. 14, *Farm Management*		4
Ag. Econ. 51, *Cooperative Business*	3	
Agron. 28, *Forage and Pasture Crops*		3
An. S. 51, *Animal Breeding*	3	
Dy. S. 63, 62, *Dairy Cattle, Advanced Dairy Science*	3	2
Dy. S. 60, *Seminar*		2
Dy. S. 65, 64, *Market Milk, Milk Production*	3	3
Dy. S. 66, *Ice Cream, Butter and Cheese*		3
Engl. 23, *Writing of Technical Reports*	2	
Electives	3	
	17	17

For students who are interested in Dairy Technology, the program of study will permit substitute courses in business administration for many of the production courses listed above.

ENTOMOLOGY

Sophomore Year

	First Semester Credits	*Second Semester Credits*
Biochem. 1, 2, *Organic and Biological Chemistry, Plant Chemistry*	5	3
Econ. 1-2, *Principles of Economics*	3	3
Ent. 41, *Insects of Orchard and Garden*	3	
Phys. (9), *Elementary Physics*		4
Zool. 7, 8, *General Zoology, Comparative Anatomy*	4	4
Electives	2	3
	17	17

Junior Year

Bact. 1, *General Bacteriology*	4	
Bot. 6, *Systematic Botany*		3
Engl. (35), *Public Speaking*		3
Engl. 25-26, *Advanced Composition*	3	3
Ent. 55, 56, *Household Insects, Forest Insects*	2	2
Ent. 57, 58, *Advanced Entomology*	4	4
Zool. 56, *Freshwater and Terrestrial Invertebrates*		4
Zool. 61, *Genetics*	3	
	16	19

Senior Year

Bot. 51, 56, *Plant Pathology, Plant Physiology*	3	4
Engl. 23, *Writing of Technical Reports*	2	
Ent. 54, *Medical Entomology*		3
Ent. 59, 60, *Advanced Economic Entomology*	3	3
Lang. 1-2, *French or German*	3	3
Electives	6	4
	17	17

Students who are interested in insect toxicology will follow the same general program of study except that they will complete additional courses in mathematics and chemistry selected in consultation with an adviser.

HORTICULTURE

Sophomore Year

	First Semester Credits	Second Semester Credits
Biochem. 1, 2, *Organic and Biological Chemistry, Plant Chemistry*	5	3
Agron. 11, 14, *Introductory Soils, Introductory Soil Fertility*	4	3
Econ. (1), *Principles of Economics*		3
Ent. 41, *Insects of Orchard and Garden*	3	
Hort. 13, 2, *Horticultural Crops and Judging, Plant Propagation*	2	2
Electives	3	6
	17	17

Junior Year

	First Semester Credits	Second Semester Credits
Bact. 1, *General Bacteriology*	4	
Bot. 51, 56, *Plant Pathology, Plant Physiology*	3	4
Hort. 94, *Plant Breeding*		3
Engl. (35), *Public Speaking*		3
Phys. 9, *Elementary Physics*	4	
Zool. 61, *Genetics*	3	
Electives	3	7
	17	17

Senior Year

	First Semester Credits	Second Semester Credits
Ag. Econ. 14, *Farm Management*		4
Bot. 53, *Plant Anatomy*	3	
Engl. 23, *Writing of Technical Reports*	2	
Hort. 91-92, *Seminar*	1	1
Electives	11	12
	17	17

Each student will select 11 additional credits in Horticulture to round out a good horticultural foundation and in accordance with his major interests. The following are suggested as desirable electives offered by other departments: Agron. 26, *Potatoes;* Agron. 58, *Soil Classification;* Arts 23, *Drawing and Design;* Arts 39, *Elementary Photography;* Bot. 2, *General Botany;* Bot. 3, *The Plant World;* Bot. 6, *Systematic Botany;* Bot. 52, *Principles of Plant Disease Control;* Bot. 54, *Cytology;* Ent. 48, *Beekeeping;* B. A. 1, 2, *Accounting;* C. E. 7, *Surveying;* Engl. 22, *News Writing;* Geol. 7, *General Geology;* Geog. 21, *The Weather.*

MECHANIZED AGRICULTURE

The following program will be varied to meet the objectives of the student. In addition to the courses listed, the student, in consultation with his adviser, may select courses from the colleges of Liberal Arts and Technology to meet the course and credit requirements of the College of Agriculture.

It is suggested that freshman students elect Bot. 42, *Plant Ecology*, as a second semester elective.

Other recommended courses are: Agron. 58, *Soil Classification*; Agron. 60, *Soil Conservation*; C. E. 31, *Community Planning*; Ent. 41, *Insects of Orchard and Garden*; Psych. 47, *Mental Hygiene.*

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
Biochem. 1, *Organic and Biological Chemistry*	5	
Ag. Eng. 17, 18, *Farm Shop*	2	2
Agron. 1, *Introductory Crop Production*	3	
Agron. 11, *Introductory Soils*	4	
Agron. 14, *Introductory Soil Fertility*		3
Engl. (35), *Public Speaking*		3
Phys. (9), *Elementary Physics*		4
Py. S. 2, *Poultry Production*		3
Soc. 39, *Rural Sociology*	3	
	17	15

JUNIOR YEAR		
Ag. Econ. 12, *Economics of the Agricultural Industry*		3
Ag. Eng. 21, *Soil and Water Conservation*	2	
Ag. Eng. 22, *Farm Power*		2
Ag. Eng. 23, *Farm Machinery*	2	
Ag. Eng. 24, *Farm Structures*		2
An. S. 13, *Feeds and Feeding*	3	
B. A. 1-2, *Principles of Accounting*	3	3
B. A. 21-22, *Commercial Law*	3	3
Hort. 53, *Pomology: Orchard Fruits*	3	
Py. S. 26, *Poultry Management*		3
	16	16

SENIOR YEAR		
Agr. 3, *Principles of Cooperative Extension Work*	2	
Ag. Econ. 14, *Farm Management*		4
Ag. Eng. 2, *Residence Planning*		2
Ag. Eng. 25, *Farm and Home Utilities*	2	
Dy. S. 5, *Fundamentals of Dairying*	3	
Dy. S. 64, *Milk Production*		3
Econ. 1, *Principles of Economics*	3	
Engl. 23, *Writing of Technical Reports*	2	
Hort. 14, *Elementary Vegetable Gardening*		3
Electives	5	5
	17	17

POULTRY SCIENCE

Sophomore Year

	First Semester Credits	*Second Semester Credits*
Biochem. 1, 4, *Organic and Biological Chemistry, Animal Nutrition*	5	3
Bact. 1, *General Bacteriology*	4	
Py. S. 3, *Avian Biology*	3	
Py. S. 6, *Poultry Nutrition*		3
Electives	2	12
	14	18

Junior Year

Ag. Econ. 12, *Agricultural Industry*		3
Py. S. 4, *Poultry Selection and Reproduction*		3
Py. S. 21, 22, *Poultry Diseases*	3	3
Py. S. 29, *Poultry Breeding*	3	
Phys. 9, *Elementary Physics*	4	
Zool. 61, *Genetics*	3	
Electives	2	8
	17	17

Senior Year

Engl. 23, (35), *Writing of Technical Reports. Public Speaking*	2	3
Py. S. 17, *Poultry Judging*	1	
Py. S. 27, 28, *Seminar*	1	1
Py. S. 53, 54, *Poultry Problems*	1–3	1–3
Py. S. 19, *Poultry Marketing*	3	
Py. S. 26, *Poultry Management*		3
Py. S. 56, *Turkey Production*		2
Electives	9–13	5–8
	17	17

PRE-VETERINARY

In the freshman year, Pre-Veterinary majors will take Chemistry 3-4 as a prerequisite for more advanced chemistry in subsequent years. The program of study is so arranged that the student will meet the course requirements of most veterinary colleges at the end of the sophomore year. The student should make known to his adviser the name of the veterinary college to which he wishes to be admitted.

Sophomore Year	*First Semester Credits*	*Second Semester Credits*
B. A. 1, *Principles of Accounting*	3	
Chem. (45), *Organic Chemistry*		5
Econ. 1, *Principles of Economics*	3	
Phys. 1-2, *Introductory Physics*	4	4
Soc. 39, *Rural Sociology*	3	
Zool. 7-8, *General*	4	4
Electives		5
	17	18

Junior Year		
Ag. Econ. 14, *Farm Management*		3
An. S. 13, 2, *Feeds and Feeding, Types and Market Classes of Livestock*	3	3
An. S. 11, 18, *Livestock Judging, Meat and Its Products*	1	2
Bact. 1, 8, *General, Pathogenic Bacteriology*	4	4
Chem. 17, *Quantitative Analysis*	4	
Dy. S. 64, *Milk Production*		3
Engl. (35), *Public Speaking*		3
Zool. 61, *Genetics*	3	
Electives	3	
	18	18

Senior Year		
Biochem. 4, *Animal Nutrition*		4
An. S. 19, 20, *Management of Horses and Beef Cattle, Sheep and Swine Science*	3	3
Bact. 53, 2, *Immunology and Serology, Food and Sanitary*	4	4
Engl. 25-26, *Advanced Composition*	3	3
Engl. 23, *Writing of Technical Reports*	2	
Gov. 1, 2, *American Government*	3	3
Electives	3	
	18	17

TEACHER PREPARATION IN AGRICULTURE

Sophomore Year	First Semester Credits	Second Semester Credits
Biochem. 1, *Organic and Biological Chemistry*	5	
Ag. Eng. 17, 18, *Farm Shop*	2	2
Agron. 11, 14, *Introductory Soils and Introductory Soil Fertility*	4	3
Ed. 42, *Principles of Educational Psychology*		3
Econ. 1, *Principles of Economics*	3	
Phys. (9), *Elementary Physics*		4
Py. S. 2, *Poultry Production*		3
Electives	3	2
	17	17
Junior Year		
Ag. Econ. 51, *Cooperative Business*	3	
Ag.-Educ. 89, 90, *Agriculture-Education*	1	1
Ag. Eng. 23, *Farm Machinery*	2	
An. S. 13, *Feeds and Feeding*	3	
Ed. 52, *American Secondary Education*		3
Ag.-Educ. 91, 92, *Agriculture-Education*	3	3
Engl. (35), *Public Speaking*		3
Ent. 41, *Insects of Orchard and Garden*	3	
Hort. 53, 14, *Orchard Fruits, Vegetable Gardening*	3	3
Electives		4
	18	17
Senior Year		
Ag. Econ. 14, *Farm Management*		4
Agron. 28, *Forage and Pasture Crops*		3
Ed. 93, (93), *Supervised Teaching*	17	
Engl. (23), *Writing of Technical Reports*		2
Electives		8
	17	17

BACHELOR OF SCIENCE IN AGRICULTURAL ENGINEERING

The purpose of this curriculum is to train men in the application of engineering knowledge and techniques to the problems of the agricultural industry. A sound academic background in the natural sciences and mathematics and the fundamentals of engineering and agriculture precede specialization in Agricultural Engineering. Most agricultural engineers are employed in the fields of farm structures, farm machinery, rural electrification, and soil and water conservation. The student has an opportunity to select courses which are of interest to him and are related to these major phases of the profession.

Students who elect this course of study are expected to prepare for engineering service in rural communities; for teaching, research, and extension work in colleges, experiment stations, and government agencies; for positions related to the manufacture and sale of farm machinery and farm power equipment; for advisory and managerial posts in connection with agricultural development; for positions with farm buildings and materials concerns; and for work relating to the increased use of electricity in agriculture. Opportunities for employment and progressive advancement after graduation are numerous in this expanding field of engineering.

FRESHMAN YEAR	*First Semester Credits*	*Second Semester Credits*
P. E. 31-32	½	½
M. S. 11-12, or A. S. 15-16	1½	1½
Agr. Eng. 15, *Agr. Eng. Shop*	1	
Chem. 3-4, *General Chemistry*	4	4
Engl. 1-2, *Freshman English*	3	3
Math. 21-22, *Technical Math I, II*	5	5
M. E. 13-14, *Engineering Drawing*	1	1
Phys. 18, *General Physics I*		4
Social Science Elective	3	
	19	19
SOPHOMORE YEAR		
M. S. 21-22, or A. S. 25-26	1½	1½
Econ. 1, *Principles of Economics*	3	
Agron. 11, *Introductory Soils*	4	
C. E. 7, *Surveying*		3
Math. 23, *Technical Math. III*	5	
Math. 24, *Differential Equations*		3
M. E. 25, *Statics*	2	
M. E. 26, *Dynamics*		3
Phys. 23-24, *General Physics II, III*	4	4
Social Science Elective		3
	19½	17½
JUNIOR YEAR		
Ag. Eng. 32, *Farm Tractors*		3
Ag. Eng. 33, *Field Machinery*	3	
E. E. (33), *Fundamentals of Electricity*		4
M. E. 33, *Thermodynamics*	3	
M. E. 35, *Strength of Materials*	3	
Approved Agricultural Electives	3	3
Approved Technical Electives	6	9
	18	19
SENIOR YEAR		
Ag. Econ. 14, *Farm Management*		4
Ag. Eng. 31, *Soil and Water Engineering*	3	
Ag. Eng. 34, *Agricultural Structures*		3
Ag. Eng. (35), *Rural Electrification*		3
Ag. Eng. 41, 42, *Special Problems in Agricultural Engineering*	1–3	1–3
C. E. 23, *Fluid Mechanics*	3	
Engl. 23, *Writing of Technical Reports*		2
Approved Technical Electives	9–11	0–2
	18	15

BACHELOR OF SCIENCE IN FORESTRY

All Forestry majors must take the same basic program to qualify for the Bachelor of Science degree in Forestry. Further requirements are designed to meet the needs of two classes of students: (1) those who desire a foundation for professional or graduate work in Forestry; and (2) those who wish to fit themselves for employment in Forest Game Management. The program for each group is approximately the same during the first two years, although it is necessary to make certain decisions rather early in the course. Attendance at an eight weeks' session of Summer Camp is required during the summer following the junior year for each group.

Forestry

This includes those students who wish to secure a general training in Forestry. Some latitude is allowed in the courses which the student may elect, but his efforts are directed toward securing a broad knowledge of the profession. Those who intend to become teachers or research workers should plan to take advanced studies, and should elect the courses necessary for admission to graduate school.

Forest Game Management

The Forest Game Management curriculum emphasizes this field while giving the student an adequate training in general Forestry. This combination is considered essential, as a large part of the country's wildlife program of the future will be handled by men who are employed primarily as foresters.

Students who are interested in fish management or fish research are advised to consider registration as majors in Biology or Zoology in the College of Liberal Arts.

A student majoring in one of the Forestry curriculums is held for the same general, specific and additional minimum requirements given on pages 35 and 36 for the Bachelor of Science in Agriculture degree.

FORESTRY

Freshman Year	*First Semester Credits*	*Second Semester Credits*
P. E. 31-32	½	½
R.O.T.C.	1½	1½
Agr. 1, *Orientation*	1	
Bot. 1, 6, *General Botany, Systematic Botany*	4	3
Chem. 1, 2, *General Chemistry*	4	4
Engl. 1-2, *Freshman English*	3	3
For. 25, *Dendrology*	2	
Math. 2, *Algebra*		3
M. E. 1, *Engineering Drawing*	2	
Zool. 48, *Principles of Zoology*		3
	18	18

SOPHOMORE YEAR

R.O.T.C.	1½	1½
Biochem. 1, *Organic and Biological Chemistry*	5	
Agron. 11, *Introductory Soils*	4	
Econ. 1, *Principles of Economics*	3	
Ent. 2, *Elementary Entomology*		3
For. 28, *Mensuration*		4
For. 27, 30, *Silvics; Seeding and Planting*	3	3
Math. 3, *Trigonometry*	3	
Social Science Elective		6
	19½	17½

JUNIOR YEAR

Bot. 51, 56, *Plant Pathology; Physiology*	3	4
C. E. 7, *Surveying*	3	
Engl. (35), *Public Speaking*		3
Ent. 56, *Forest Insects*		2
For. 29, *Silviculture*	3	
For. 34, *Forest Fish and Game*		3
For. 43, 44, *Advanced Mensuration; Forest Economics*	3	3
Phys. 9, *Elementary Physics*	4	
Social Science Elective		3
Electives	2	
	18	18

SUMMER SESSION

For. 42, *Forest Engineering*	4
For. 45, *Timber Survey*	6
	10

SENIOR YEAR

Engl. (23), *Writing of Technical Reports*		2
For. 31, 32, *Forest Utilization*	4	4
For. 33, 26, *Forest Protection; Wood Identification*	3	3
For. 39, 40, *Forest Management*	4	4
For. 57, 64, *Photogrammetry; Forest Industry Economy*	4	3
*For. 37, *Forest Recreation*	3	3
*For. 61, 62, *Problems*	2–4	2–4
	17	17

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*Elective

FOREST GAME MANAGEMENT

	First Semester Credits	Second Semester Credits
FRESHMAN YEAR		
Same as for Forestry		
SOPHOMORE YEAR		
R.O.T.C.	1½	1½
Biochem. 1, *Organic and Biological Chemistry*	5	
C. E. 7, *Surveying*	3	
Econ. 1, *Principles of Economics*	3	
Ent. 2, *Elementary Entomology*		3
For. 28, *Mensuration*		4
Math. 3, *Trigonometry*	3	
Zool. 7, 8, *General Zoology; Comparative Anatomy*	5	5
Zool. 36, *Ornithology*		3
Social Science Elective		3
	19½	19½
JUNIOR YEAR		
Bot. 56, *Physiology*		4
Engl. (23), *Writing of Technical Reports*		2
For. 29, 44, *Silviculture; Forest Economics*	3	3
For. 34, *Forest Fish and Game*		3
Phys. 9, *Elementary Physics*	4	
Zool. 51, *Parasitology*	4	
Zool. 71, 72, *Principles of Ecology*	4	4
Zool. 77, *Natural History and Taxonomy of the Vertebrates*	5	
Social Science Elective		3
	20	19
SUMMER SESSION		
For. 41, *Wildlife Field Studies*	10	
SENIOR YEAR		
Agron. 11, *Introductory Soils*	4	
Engl. 35, *Public Speaking*	3	
For. 31 or 32, *Forest Utilization*	4	4
For. 33, *Forest Protection*	3	
For. 39, 40, *Forest Management*	4	4
For. 55, 56, *Forest Game Management*	4	4
*Bot. 57, *Aquatic Botany*	2	
*Ent. 56, *Forest Insects*		2
*For. 26, *Wood Identification*		3
*For. 57, *Photogrammetry*	4	
*For. 61, 62, *Problems*	2–4	2–4
*Geog. 21, *Weather*	2	
	17	17

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*Elective

BACHELOR OF SCIENCE IN HOME ECONOMICS

There are four curriculums offered in Home Economics, all leading to a Bachelor of Science degree in Home Economics: (1) General Home Economics, (2) Clothing and Textiles, (3) Food, Nutrition, and Institutional Administration, and (4) Teacher Preparation.

Those students desiring a broad and general education in preparation for homemaking are advised to take the General Home Economics curriculum. Students desiring special training in preparation for professional careers should take one of the other curriculums, according to their interests and aptitudes.

A student majoring in any one of the above curriculums is required to meet the specific and additional minimum requirements of the College of Agriculture as listed below:

SPECIFIC REQUIREMENTS

Except for Physical Education these requirements should be completed during the freshman year.

Agriculture 1
Botany 1, Zoology 48, Biology 1-2
Chemistry 1, 2 or 3, 4
English 1-2
Physical Education 1, 2, 3, 4, 5, 6

ADDITIONAL MINIMUM REQUIREMENTS

These requirements are ordinarily completed during the sophomore, junior, or senior years.

Biological Sciences (Bacteriology, Botany, Zoology, Entomology 2, 41)	3
Chemistry (Biochemistry or Chemistry)	5
Economics 1	3
Economics or Agricultural Economics	3
English	5
Social Sciences (Government, History, Psychology, Sociology, Education 41, 42, 52)	6

Suggested curriculums in Home Economics are as follows:

GENERAL HOME ECONOMICS

Freshman Year	*First Semester Credits*	*Second Semester Credits*
P. E. 1, 2	1	1
Agr. 1, *Orientation*	1	
Arts 23, *Elementary Drawing and Design*	2	
Biol. 1-2, *Man and the Living World* or Bot. 1, *General Botany*, Zool. 48, *Principles of Zoology*	3–4	3
Chem. 1-2, *General Chemistry*	4	4
Engl. 1-2, *Freshman English*	3	3
H. E. 2, *Costume Selection*		2
H. E. 9, *Food Selection*	2	
Electives	0–3	3
	16–17	16

Sophomore Year

P. E. 3, 4	1	1
Biochem. 1, *Organic and Biological Chemistry*	5	
Biochem. 6, *Chemistry of Food and Nutrition*		3
Econ. 1, *Principles of Economics*	3	
Econ. 2, *Principles of Economics or* Ag. Econ. 34, *Economics of Consumption*		3
H. E. 3, *Textiles*	3	
H. E. 6, *Principles of Clothing Construction*		3
H. E. 15-16, *Food Preparation*	3	3
Electives	3	5
	18	18

Junior Year

P. E. 5, 6	1	1
Ag. Eng. 2, *Residence Planning*		2
H. E. 25-26, *Child Development*	3	3
H. E. 32, *Interior Decoration*		3
H. E. 33, *Home Management*	3	
H. E. (35), *Home Management Residence*		3
Electives	10	5
	17	17

Senior Year

H. E. 83, *Home and Family Living*	3	
Electives	14	17
	17	17

The student must complete 5 semester hours of English, 3 semester hours of a biological science, and 12 semester hours selected from at least three of the following departments: Government, History, Philosophy, Phychology, Sociology.

CLOTHING AND TEXTILES

Freshman Year	*First Semester Credits*	*Second Semester Credits*
P. E. 1, 2	1	1
Ag. 1, *Orientation*	1	
Arts 23-24, *Elementary Drawing and Design*	2	2
Bot. 1, *General Botany*	4	
Chem. 3-4, *General Chemistry*	4	4
Engl. 1-2, *Freshman English*	3	3
H. E. 2, *Costume Selection*		2
H. E. 9, *Food Selection*	2	
Math. 2, *Algebra*		3
Zool. 48, *Principles of Zoology*		3
	17	18

SOPHOMORE YEAR

P. E. 3, 4	1	1
Bact. 1, *General Bacteriology*	4	
Chem. (45), *Organic Chemistry*		5
Econ. 1-2, *Principles of Economics*	3	3
H. E. 3, *Textiles*	3	
H. E. 6, *Principles of Clothing Construction*		3
H. E. 15-16, *Food Preparation*	3	3
Psych. 1, *General Psychology*	3	
Soc. 1, *Principles of Sociology*		3
	17	18

JUNIOR YEAR

P. E. 5, 6	1	1
B. A. 46, *Principles of Retailing*		3
Econ. 25, *Marketing*	3	
H. E. 32, *Interior Decoration*		3
Physics 9, *Elementary Physics*	4	
English Elective	3–2	
Electives	6–7	10
	17	17

SENIOR YEAR

H. E. 63, *Draping*	3	
H. E. (64), *Advanced Textiles*	3	
H. E. 65, *History of Costume*	3	
H. E. 66, *Costume Design and Fashion Illustration*		2
H. E. 68, *Fundamentals of Fashion*		3
English Electives		3–2
Electives	8	9–10
	17	17

Additional requirements and suggested electives for those interested in the following areas:

Costume Design —
Requirements: H. E. 60, 61
Electives: Arts 5, 6, 8, 28, 88; H. E. 48

Interior Decoration —
Requirements: H. E. 67
Electives: Agr. Eng. 2; Arts 6, 8, 28, 88; H. E. 33, 35, 48, 98; Hort. 27, 37

Merchandising —
Requirements: B. A. 1-2; H. E. 60, 61
Electives: Arts 28; B. A. 45, 47, 68; Econ. 51; H. E. 48, 67, 98; Psych. 32

Textile Research —
Requirements: H. E. 60, 61
Electives: Arts 6, 8; Chem. 17, 26; H. E. 48; Psych. 32

FOODS, NUTRITION, AND INSTITUTIONAL ADMINISTRATION

FRESHMAN YEAR	*First Semester Credits*	*Second Semester Credits*
P. E. 1, 2	1	1
Agr. 1, *Orientation*	1	
Arts 23, *Elementary Drawing and Design*	2	
Biol. 1-2, *Man and the Living World*	3	3
Chem. 3-4, *General Chemistry*	4	4
Engl. 1-2, *Freshman English*	3	3
H. E. 2, *Costume Selection*		2
H. E. 9, *Food Selection*	2	
Math. 2, *Algebra*		3
	16	16
SOPHOMORE YEAR		
P. E. 3, 4	1	1
Ag. Econ. 34, *Economics of Consumption*		3
Chem. 45, *Organic Chemistry*	5	
Econ. 1, *Principles of Economics*	3	
H. E. 6, *Principles of Clothing Construction*		3
H. E. 15-16, *Food Preparation*	3	3
Phys. (9), *Elementary Physics*		4
Psych. 1, *General Psychology*	3	
English Elective		2–3
Electives	2	
	17	16
JUNIOR YEAR		
P. E. 5, 6	1	1
Chem. 17, *Introductory Quantitative Analysis*	4	
Engl. 35 (35), *Public Speaking*	3 or	3
H. E. 73, *Nutrition*	3	
Electives	3	13
	14	17
SENIOR YEAR		
Bact. 1, *General Bacteriology*	4	
H. E. 35, *Home Management Residence*	3	
H. E. 71, *Experimental Foods*	2	
Electives	8	17
	17	17

Additional required courses for those interested in the following areas:

Food and Nutrition Research —
Biochem. 51-52; Chem. 26; Engl. (23); H. E. 72, 74, 76; Zool. 17, 18

Foods and Nutrition —
Educ. Elective: H. E. 3, 48, 51, 52, 53, 55, 56, 74, 93; Psych. 32; Soc. Elective; Zool. 17, 18

Institutional Administration —
B. A. 1, 2; Econ. 2 (in sophomore year), 25, 51; Educ. Elective; H. E. 46, 48, 51, 52, 53, 55, 56, 76; Psych. 32; Soc. Elective

TEACHER PREPARATION IN HOME ECONOMICS

FRESHMAN YEAR	*First Semester Credits*	*Second Semester Credits*
P. E. 1, 2	1	1
Agr. 1, *Orientation*	1	
Arts 23, *Elementary Drawing and Design*	2	
Biol. 1-2, *Man and the Living World* or Bot. 1, *General Botany*, Zool. 48, *Principles of Zoology*	3–4	3
Chem. 1-2, *General Chemistry*	4	4
Eng. 1-2, *Freshman English*	3	3
H. E. 2, *Costume Selection*		2
H. E. 9, *Food Selection*	2	
Electives	0–3	3–6
	16–19	16–19

SOPHOMORE YEAR		
P. E. 3, 4	1	1
Biochem. 1, *Organic and Biological Chemistry*	5	
Biochem. 6, *Chemistry of Food and Nutrition*		3
Econ. 1, *Principles of Economics*	3	
Econ. 2, *Principles of Economics* or Ag. Econ. 34, *Economics of Consumption*		3
Ed. 41, 42, *Educational Psychology*	3	3
H. E. 3, *Textiles*	3	
H. E. 6, *Principles of Clothing Construction*		3
H. E. 15-16, *Food Preparation*	3	3
Psych. (1), *General Psychology*		3
	18	19

JUNIOR YEAR		
P. E. 5, 6	1	1
Ag. Eng. 2, *Residence Planning*		2
Bact. 1, *General Bacteriology* or Bact. 5, *Public Health and Sanitation*	4–3	
Educ. 52, *Principles of American Secondary Education*		3
H. E. 25, 26, *Child Development*	3	3
H. E. 32, *Interior Decoration*		3
H. E. 33, *Home Management*	3	
H. E. 73, *Nutrition*	3	
Electives, English, Sociology (junior and senior year)	3	3
H. E. 60, *Flat Pattern*		3
	16–17	18

Senior Year

H. E. 35, (35), *Home Management Residence*	3	or	3
H. E. 83, *Home and Family Living*	3		
H. E. 84, *Personal, Family, and Community Health*			2
H. E. 91, *Principles and Problems of Home Economics Education*	3		
H. E. 94, *Supervised Teaching in Home Economics*			7
H. E. 96, *Seminar in Home Economics Education*			3
H. E. 98, *Preparation and Evaluation of Illustrative Materials*			2
English Elective	2–3		
Electives, English, Sociology (junior or senior year)	3		
Engl. 35, *Public Speaking* or Engl. (36), *Speech for Teachers*	3		
	14–18		14–17

Additional requirements for certification — H. E. (48), 48 following sophomore and junior years to meet individual needs. 2 credits.

TWO-YEAR NON-DEGREE CURRICULUM

The Thompson School of Agriculture offers young men and women who are interested in farming and allied occupations the opportunity to secure scientific and practical agricultural training in two years of study. These vocational curriculums are designed particularly for those who wish to become farmers or to seek employment in related activities. Some of the more common types of opportunities available for the two-year student follow:

- Farming — owner, renter, operator
- Farm manager or estate superintendent
- Herdsman or assistant
- Milk plant operator or assistant
- Poultry plant foreman
- Feed and fertilizer store operator or assistant
- Greenhouse or landscape work
- Skilled worker for nurserymen and seedsmen
- Farm machinery worker — sales, service, or operation
- Worker in retail agricultural marketing
- Milk tester
- Caretaker of estate
- Superintendent, foreman, or worker in parks
- Worker in a commercial dairy manufacturing and distributing plant

Admission Requirements

The Thompson School of Agriculture is open to both young men and young women. Graduates of high schools will be admitted irrespective of age. Applicants who are not high-school graduates must be 18 years of age and must have had at least two years of high-school work or its equivalent. Judgment and understanding will be carefully considered in determining those who will be admitted. A farm background, though not required, will prove exceptionally valuable.

Requirements for Graduation

The completion of the program requires two calendar years. The instruction is divided as follows: the student obtains two semesters of classroom and laboratory work on campus, followed by a summer of supervised Agricultural Placement each year. However, it is possible for a person to attend the Thompson School of Agriculture for only two or more semesters, plus Agricultural Placement, and acquire considerable valuable information and first-hand knowledge of farming. Upon satisfactory completion of four semesters on campus, with a minimum of 68 semester credits plus two summers of Agricultural Placement in the order described, the student will be awarded a certificate of graduation.

The Agricultural Placement will be adapted to the personal needs and interests of the individual. This work may be conducted on the home farm, on some good commercial farm known to the student, or in some related agricultural occupation in which the student plans to engage. All placement situations selected by the student, through his own initiative, must be approved by the school staff. Every effort will be made to find suitable placement positions for students who are unable to locate such positions for themselves.

This practical training, required during each summer, will be under the direct guidance and supervision of the teaching staff. Certain records and reports are required of the student while on placement, and no student will be granted a certificate until such records and reports are complete.

Major Fields of Instruction

There are four major fields of instruction: Dairying, General Farming, Horticulture, and Poultry. The student will select the one he wishes to pursue and may elect courses in other fields in order to provide for a well-balanced program.

Facilities for Instruction

Facilities of the University, including the University farm, dairy herd, milk plant, poultry plant, horticulture farm, livestock department, greenhouses, and laboratories, are available for instructional purposes.

Student Aid

Employment is usually available for the student who needs it and is willing to work. Tuition grants amounting to approximately one-half the tuition are available for residents of New Hampshire. These tuition grants will be awarded to such applicants as appear, upon investigation, to be needy and deserving. It is hoped that every worthy individual, who could not otherwise attend, may be helped in this way. However, these funds are by no means inexhaustible and prospective students are urged to apply early if they need help.

Additional Information

Persons who are interested in the Thompson School of Agriculture should write for a complete descriptive catalogue. Such requests should be made to the Thompson School of Agriculture, 14 Putnam Hall, University of New Hampshire, Durham, N. H.

The College of Liberal Arts

EDWARD Y. BLEWETT, *Dean*

PAUL E. SCHAEFER, *Associate Dean*

DEPARTMENTS

THE ARTS
  Fine Arts, Design, Crafts, Occupational Therapy, and Photography
BACTERIOLOGY
  Medical Technology
ECONOMICS AND BUSINESS ADMINISTRATION
  Business, Economics, and Secretarial Studies
EDUCATION
ENGLISH
  Dramatics and Speech
GEOLOGY AND GEOGRAPHY
  General Physical Science
GOVERNMENT
  Public Administration Service
HISTORY
HOTEL ADMINISTRATION
LANGUAGES
  French, German, Greek, Italian, Latin, and Spanish
MUSIC
PHILOSOPHY
PSYCHOLOGY
SOCIOLOGY
  Social Service
ZOOLOGY
  Nursing and Pre-Medicine

The departments of Chemistry, Mathematics, and Physics in the College of Technology and the departments of Botany and Entomology in the College of Agriculture offer major programs for students in the College of Liberal Arts.

PURPOSE AND OBJECTIVES

The College of Liberal Arts exists to serve society through meeting the vital educational needs on the campus or in the state. While it prepares some students for scholarly achievement in graduate and professional schools and prepares others for immediate gainful service, it develops in all its students understanding, interests, appreciation, and abilities which make possible the living of a richer and more satisfying life.

It is the purpose of the College of Liberal Arts to help all its students to become better adjusted to the world in which they live, to increase their efficiency as students, to learn how to work and to enjoy work as well as leisure, to solve their college and life problems, and to prepare themselves for intelligent participation in the activities of modern life as socially competent human beings willing to meet their responsibilities to society.

To accomplish its general educational purpose, the College of Liberal Arts cooperates with its students in their efforts to acquire:

(1) The ability to understand and use language, particularly English, for clear and effective interchange of ideas;

(2) An understanding and appreciation of the principles of the physical and biological sciences as they apply to man;

(3) An understanding of the principles underlying the social, psychological, political, and economic activities of man;

(4) An understanding and appreciation of all peoples and their cultures, both contemporary and historical, for intelligent participation in society;

(5) An understanding and appreciation of literature and the other arts;

(6) An understanding and appreciation of the religious heritage of man and its significance for present-day living;

(7) An understanding of personal and community health;

(8) An understanding of the interrelation of the various fields of knowledge;

(9) A competence in a selected field of knowledge, based on a concentration of studies for vocational or other interests;

(10) Aid in selecting and preparing for a suitable profession or vocation;

(11) A variety of interests outside of the selected field of knowledge, for the purpose of providing avocations or occupations for leisure time in post-college days;

(12) An eagerness for knowledge as a means to continuous self-education;

(13) The ability to seek, discover, and analyze data and therefrom make valid generalizations;

(14) The ability to form unbiased and rational judgments of other individuals and their ideas;

(15) The desire to discover and accept responsibilities, for the improvement of human living;

(16) Principles and convictions about life which may change as experience increases, and upon which their whole conduct shall be founded.

ORGANIZATION

The development of common interests and the coordination of educational efforts in behalf of students in the College are promoted by divisions as follows: Biological Sciences, Humanities, Physical Sciences, Social Sciences, and Teacher Education. The personnel of each division includes all Faculty members assigned to departments of the College, and to departments of other colleges which are authorized to offer major programs or prescribed curriculums in the College of Liberal Arts.

The *Humanities Division* is composed of the staffs of the departments of The Arts, English, Languages, Music, and Philosophy. The *Social Sciences Division* is composed of the staffs of the departments of Economics and Business Administration, Government, History, Hotel Administration, Psychology, and Sociology. The *Physical Sciences Division* is composed of the staffs of the department of Geology and Geography, and the departments of Chemistry, Mathematics, and Physics in the College of Technology. The *Biological Sciences Division* is composed of the staffs of the departments of Bacteriology and Zoology, and the departments of Botany and Entomology in the College of Agriculture. The *Division of Teacher Education* consists of the members of the instructional staff of the University who are teaching professional courses in Education. These include courses in the problems of teaching the subjects taught in the public schools and the courses in Physical Education, in The Arts, and in Music, designed to prepare teachers.

The offerings of the College of Liberal Arts are divided into two groups: the *General Liberal Arts* curriculum and the *Prescribed* curriculums. The descriptions of the University Teacher Preparation curriculums follow the Prescribed curriculums.

GENERAL LIBERAL ARTS CURRICULUM

The General Liberal Arts curriculum is intended primarily to give opportunity for a broad, liberal program, a general education leading to the **Bachelor of Arts** degree.

A student enrolled in the General Liberal Arts curriculum will major in some subject or field of knowledge. Some of these major programs offer, at least in part, direct professional training. The *General Liberal Arts* curriculum must not be confused with the *Prescribed* curriculums. The latter are essentially professional in character.

The objectives, opportunities, and requirements of majors in the General Liberal Arts curriculum are described in the paragraphs which follow. It is possible, also, for students in the General Liberal Arts curriculum to arrange programs of study in addition to those described below, although such students will be held strictly to the University and College requirements of the General Liberal Arts curriculum. *Students interested in arranging special programs of study should consult the Dean of the College.*

The Arts

The Department of The Arts offers two professional programs, Art Education and Occupational Therapy. A major in The Arts is open to students in the General Liberal Arts program who wish to concentrate in the visual arts. Many courses in the department are open to students in other major programs who wish to elect work; included in such offerings are courses in history, design, drawing and painting, graphic arts, photography, advertising design, illustration, sculpture, ceramics, weaving, metal work and jewelry, wood-working and plastics, drafting, etc. Changing exhibitions are organized and arranged in the University Gallery. An experimental arts laboratory is operated in Hewitt Hall under the name, The Student Workshop. All courses in the department and the Student Workshop program are designed to develop intelligent enjoyment and a critical understanding of the arts, and to provide facilities for creative expression.

Several types of programs may be arranged to meet the individual needs of students majoring in The Arts. For example, one may concentrate in design and painting, or in the crafts area, or one may elect a program which provides opportunities in a combination of areas. The final program is worked out in consultation with the adviser at the time of declaring one's major.

Students majoring in areas in which an understanding of the arts may be desirable, such as business, education, hotel administration, home economics, etc., are invited to consider taking one or several courses in the department.

Students majoring in The Arts are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They must also earn 24 semester credits, with grades of C or better, in courses in The Arts. The following courses are required for The Arts major: Arts 23, *Basic Design* (does not carry major credit); Arts 31, 32, *Introduction to The Arts.* Courses in dramatics, literature, music, and home economics may be approved as related work for a major in The Arts with the consent of the supervisor and the College Dean. The courses of each major program are selected to meet the needs of the student, as determined in conference by the student and his supervisor. An assigned major work and/or a paper in the student's area of specialization will be required in the senior year.

Students interested in majoring in *The Arts* are advised to consult with the supervisor, Professor G. R. Thomas, Room 218, Hewitt Hall.

Bacteriology

Students interested in the study of bacteria and related microorganisms should register as majors in Bacteriology. Such students may prepare themselves for positions in universities, experiment stations, research institutes, industrial organizations, and in federal, state, or city laboratories. Opportunities are available in the fields of medical or public health bacteriology, animal diseases, and in sanitary, food, dairy, soil or industrial microbiology. Students may also prepare themselves for employment as sanitary inspectors or in other phases of public health work.

The program is arranged to meet the needs of two groups of majors: (1) those who plan to obtain employment after receiving the Bachelor of Arts degree and (2) those who plan to take graduate work in Bacteriology, which is necessary for preferred employment in the field. Students primarily interested in hospital laboratory work should consult the *Medical Technology* curriculum.

Students who major in Bacteriology are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are expected also to complete courses offered by the Department, and by related departments, to a total of 24 semester credits, with grades of C or better. *A course in Organic Chemistry is also required for Bacteriology majors, but cannot be counted as part of these 24 major credits.* The courses of each major program are selected to meet the needs of the individual student, as determined by the student and his supervisor in personal conference.

Students interested in majoring in *Bacteriology* are advised to consult with the supervisor, Professor L. W. Slanetz, Room 215, Nesmith Hall.

Biology

Students who are interested in a broad background in the life sciences are advised to major in Biology. Such students will be required to take courses in bacteriology, botany, entomology, and zoology in building up a program. The field, however, is so inclusive that the majority of students will find it desirable to include one or two additional courses in one of the subdivisions, such as Bacteriology, Botany, or Zoology. In addition to students who desire to study Biology for general education, it is suggested that those who are interested in *Applied Biology* and *Secondary-School Teacher Preparation* register as Biology majors. Students who are interested in Forest Game Management are advised to consider registration in the curriculum of that name offered by the Department of Forestry in the College of Agriculture.

TEACHER PREPARATION — Students who are planning to teach Biology in secondary schools are urged to plan for practice teaching during the senior year. As few positions are available in any year for teaching Biology alone, a student should include courses in his program of study which will qualify him for teaching other sciences.

APPLIED BIOLOGY — Students preparing for positions which involve the application of the science of Biology, such as those frequently listed by the Federal Civil Service, the state governments, and industry, should follow the general program of Biology majors and should elect one or two additional courses in fields of Applied Biology. The Division is well fitted to assist in the preparation of students for work in fish and game research, conservation education, and in state departments of conservation. Students preparing for professions in this group should plan to secure advanced degrees, since positions in these fields are difficult to secure without graduate study. Students who are interested in hospital laboratory work should consult the *Medical Technology* curriculum.

Satisfactory completion of the requirements of a Biology major will generally qualify students for admission to graduate schools to specialize in Biology or in one of its major subdivisions.

Students who major in Biology are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are expected also to complete courses offered in the Division to a total of 24 semester credits (exclusive of Biology 1-2) with a grade of C or better. The minimum course requirements for Biology majors include Bacteriology 1; Botany 3; one course selected from Botany 6, 12, 42, or 56; Entomology 2; Zoology 7; and one other course in Zoology (except Zoology 87, 88 or 97, 98). *Biology majors are also required to complete Chemistry 3-4 and eight additional hours in physical science (Chemistry, Geology, Mathematics, Physical Science 1-2 or Physics). These courses in physical science cannot be offered as major credit.*

Students interested in majoring in *Biology* are advised to consult with the supervisor, Professor E. F. Swan, Room 102, Nesmith Hall.

Botany

Students who are interested in plant life are advised to consider registration as majors in Botany. Botany majors with suitable undergraduate backgrounds may enter the field of secondary education or become research technicians. Botany majors, other than those whose interest is secondary-school teaching, research technique, or a general education, should expect to continue in graduate study here or elsewhere. Government work, institutional research, certain types of industrial positions, and college teaching are open to Botany students with advanced preparation. The principal fields of concentration in Botany are: (1) Pathology, (2) Physiology, (3) Taxonomy, (4) Ecology, (5) Morphology and Anatomy, (6) Cytology.

Students who major in Botany are expected to meet in full requirements of the General Liberal Arts curriculum (page 95). They must also complete courses offered by the Department, to a total of 24 semester credits with grades of C or better. Courses in other departments closely related to the major courses may be counted with the consent of the major supervisor and the College Dean. A broad background in chemistry and other biological sciences is considered essential for most majors.

The courses of each major program are selected to meet the needs of the individual student, as determined by the student and his supervisor in personal conference.

Students interested in majoring in *Botany* are advised to consult with the supervisor, Professor A. R. Hodgdon, Room 218, Nesmith Hall.

Chemistry

Students who are interested in the study of Chemistry will find opportunities in different fields such as (1) individual work involving the development of processes or production activities or sales work based on a scientific knowledge of the marketable product; (2) the teaching of Chemistry and allied subjects in secondary schools or of Chemistry in colleges; and (3) graduate study for those students who are interested and particularly proficient in their undergraduate work.

The University offers two channels for study of Chemistry; majoring in the subject in the College of Liberal Arts, or enrolling in the Prescribed curriculum in *Chemistry* in the College of Technology. In the College of Liberal Arts a major should complete Chemistry 3-4, or 5-6, *General Chemistry*, certain courses in Mathematics and Physics, and in addition other courses offered by the Department in *Analytical*, *Organic*, and *Physical Chemistry* to a minimum of 24 semester credits, with grades of C or better. According to the student's interests, other supporting subjects may be elected to form a broad program of study and to prepare for some one of the opportunities listed above. Majors in Chemistry are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95).

The Department is equipped to furnish the preparation necessary for teaching Chemistry in secondary schools. As very few positions are available in any year for teaching Chemistry alone, a student should consider a program of study which may qualify him for teaching Chemistry and other sciences, and should consult Professor Iddles and Professor T. O. Marshall of the Department of Education. Students who are interested in teaching Chemistry in college are advised to plan on graduate study.

Students who plan to major in *Chemistry* are advised to consult with the supervisor, Professor H. A. Iddles, Room 117, James Hall.

Economics

Students who are interested in economic and business life, but do not desire to specialize intensively in the *Business* curriculum or the *Secretarial* curriculum, are advised to consider registration as majors in Economics. Students who intend to enter upon graduate study in Economics should plan to major in this field as undergraduates. An increasing number of opportunities in business and the public service are open to young people who possess graduate preparation in Economics.

Business positions in retail stores, chain stores, banks, sales organizations, general business offices, insurance, and other firms, have been successfully filled by graduates of the University who have majored in Economics. The Business curriculum provides specific preparation for several of these fields by reason of its specialized requirements. A student who desires breadth in his education, with an emphasis on Economics, is counseled to major in the Department.

The Department is equipped to furnish the preparation necessary for teaching Economics in secondary schools. As very few positions are available in any year for teaching Economics alone, a student should consider a program of study which may qualify him for teaching Economics and other social studies, and should consult the supervisor, and Professor T. O. Marshall of the Department of Education.

Students who major in Economics are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are required to complete successfully Economics 1-2, *Principles of Economics;* and Economics 31, *Economics and Business Statistics*. They are required to complete 24 semester credits of Economics, with grades of C or better. Of these 24 semester credits, a minimum of 12 credits must be in courses in Economics numbered 51 or higher. *Major credit towards the 12 semester hours required in courses numbered above 50 will be approved in the case of transfer students only if such courses have been taken as upper division* *courses, i.e., in the junior or senior year.* Individual programs will be arranged to meet the needs of the individual student. *Business Administration* 1-2, 21-22, 68, and 70 may be counted in partial fulfillment of the requirement that 12 semester credits be in courses numbered 51 or higher.

Students interested in a major in *Economics* should consult with the supervisor, Professor C. M. Degler, Room 104, Morrill Hall.

Education

Students who are interested in preparing themselves for teaching in the secondary schools and who do not desire to follow any of the University Teacher Preparation curriculums should consult with Professor T. O. Marshall of the Department of Education, Room 3, Murkland Hall. *Under most circumstances it is possible for such students to prepare themselves for teaching as majors in the subject matter department in which they desire to teach.* (See page 88). In other instances, it may be wise for them to do their work as majors in Education.

One group majoring in Education does so to prepare to teach in secondary schools. They are required to complete 24 semester credits in Education, with grades of C or better, *which must include a minimum of six semester credits in supervised practice teaching and a minimum of 15 semester credits in Education courses other than practice teaching.* These students are also required to complete, with an average grade of at least C, (1) a teaching major of at least 24 semester credits of post-secondary school work in a subject matter field, and (2) either a second teaching major of at least 18 semester credits, or two teaching minors of 12 semester credits each.

A second group of majors in Education is composed of those students who are interested in teaching or in supervising in elementary schools, and who are graduates of two- or three-year normal schools or teachers colleges. They are required to complete, with grades of C or better, 12 semester credits of work in elementary education selected from the advanced courses in that subject offered in the Summer Session as a part of the total credits which are required of them as candidates for the degree of Bachelor of Arts. Such students will select the remainder of their major program with the advice and approval of the Chairman of the Department of Education. (See special Language requirement, page 95).

While some courses offered in Education are designed to be of interest to the general student, only those students who have definitely decided to prepare themselves for the teaching profession should seriously consider majoring in the Department of Education. *All students, before entering Education 58, are required to take a battery of teacher aptitude examinations.*

Professor T. O. Marshall, Room 3, Murkland Hall, is supervisor of all majors in *Education*. Arrangements will be made, however, to enable majors in Education to be advised in particular problems by members of the staff who are best qualified to be of service to them.

English

The Department of English offers two programs of study: the *Literature* major and the *Teaching* major.

I. The *Literature* major must fulfill the requirements of the General Liberal Arts curriculum (page 95). He must also present six credits from among the following courses:

English 12
English 13, 14
English 15, 16
English 25-26
English 33, 34, 35, 47
English 43, 44, 45

He must earn grades of C or better in 24 semester credits in literature courses numbered above 50: of these, 6 credits must be in Shakespeare (English 57, 58); 6 credits in American literature (this requirement may be satisfied by English 15, 16, but the 6 credits thus earned cannot be counted toward the 24 major credits); and an additional 12 credits in at least three centuries of English literature prior to the twentieth. He must read the works of English and American literature that appear on the Department Reading List. He may elect either to cover this material in tutorial sessions or to take written examinations upon it. On request he will be given copies of previous examinations.

II. The *Teaching* major must meet in full the requirements of the General Liberal Arts curriculum (page 95) and the state certification requirements for teaching. He must also take the following courses, 24 credits of which must be passed with grade of C or better:

English 13, 14
English 16
English 25
English 27
English 22, 33, or 48
English 36
English 43, 44, and 45
English 57 or 58
English-Education 91

Students who are interested in majoring in *English* should consult with the supervisor, Professor S. H. Bingham, Room 118, Murkland Hall.

Entomology

The Department of Entomology offers various courses for students who wish to specialize in the study of insect life, insect control, and insects in relation to man. There are many fields open to those qualified in Entomology. There are opportunities for employment in public institutions and organizations, and in addition, there are many opportunities for employment with commercial and industrial firms which frequently employ college graduates who have majored in this field of study. Graduate study is desirable for the student who seeks high achievement in Entomology. A more intensive program in Entomology may be secured in the Prescribed curriculum offered in the College of Agriculture.

Students who major in *Entomology* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are expected also to complete successfully courses offered by the Department, to a total of 24 semester credits, with grades of C or better. Courses in other departments may be counted with the consent of the major supervisor and the College Dean.

Outlines of specific suggested programs of study are available to the student upon request to the supervisor, Professor J. G. Conklin, Room 18, Nesmith Hall.

General Physical Science

A student having broad interest in physical science, but no professional objective in any one of the recognized sciences in this field, may register as a *General Physical Science* major.

Students who major in General Physical Science are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). In addition, they must complete each of the following courses, and achieve in them an overall grade point average of 2.3 or better: Mathematics 7-8, *Fundamental Mathematics*, 9-10, *Differential and Integral Calculus*, and 30, *Astronomy;* Chemistry 3-4, *General Chemistry*, and 21, *Semimicro Qualitative Analysis;* Geography 21, *The Weather*, and 22, *Climates of the World;* Geology 1-2, *Principles of Geology;* and Physics 1-2, *Introductory Physics*.

Students who are interested in choosing *General Physical Science* as a major should consult with the supervisor, Professor N. McL. Sage, Room 10, Conant Hall.

Geology

The field of Geology includes the earth sciences. This is not alone the study of minerals, rocks, and evidence of prehistoric life. It includes also the history of the earth from its beginning, as well as the evolution of the landscape, and other environmental features which have influenced the development of life on the earth, including man.

Students who are interested in the earth sciences, both those who expect to make some phase of geology their life work, and those who desire to build a program of liberal studies around a core of geological and related subjects, are advised to register as majors in *Geology*.

The search for new sources of essential mineral resources and the development of new uses for certain minerals have emphasized the need for men trained in the earth sciences. Positions as mining geologists, petroleum geologists, mine operators, federal and state survey geologists, and university and college professors of geology and mineralogy have been successfully filled by graduates of the University who have majored in Geology. Other former major students are teaching in high schools or are in business, some in fields where their geologic preparation is useful, as in the cement and mining-machine industries.

Students who major in Geology are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are expected also to complete Geology 1-2, *Principles of Geology*, and, in addition, courses in Geology or related courses approved by the supervisor and the College Dean to a total of 24 semester credits with grades of C or better. The courses of each major program are selected to meet the needs of the individual student, as determined by the student and his supervisor in personal conference.

At the end of the senior year, a student who majors in Geology must, after consultation with his supervisor, submit either a satisfactory paper or pass a written comprehensive examination.

Students who are interested in majoring in *Geology* are advised to consult with the supervisor, Professor N. McL. Sage, Room 10, Conant Hall. After a student's major interest is determined, the advice, assistance, and counsel of one or more additional members of the Department will be sought where a special area of concentration is contemplated by the student. For example, the student whose special interest lies in geographic or meteorologic fields will be assigned to the staff members responsible for these fields.

Government

The courses offered by the Department of Government are designed to aid the student in gaining a knowledge of the nature, functions, and problems of government, and of the place of government in the modern world. For this general purpose, courses are offered in public affairs — local, state, national, and international. Some courses listed by the Department are chiefly intended to provide information needed for intelligent and responsible citizenship and to provide a part of a liberal education. Others are of a specialized nature and have been planned to provide basic preparation for professional work. A few are intended to stress the historical and philosophical development of the growth of political thought and institutions.

By specializing in one of serveral programs of Government, the major student may prepare himself for (1) graduate study in political science and government, (2) public administration, (3) research in government, (4) the study of law, (5) graduate study for the foreign service, (6) teaching government courses in secondary schools. Students who are preparing to teach government courses in the secondary schools should check their planned program of study with Professor T. O. Marshall of the Department of Education. Ordinarily, prospective teachers of government courses will find it necessary to teach related courses in the social sciences.

Majors in *Government* have an unusual opportunity for mastering research techniques and gaining practical information concerning state and local government in New Hampshire through work as an intern in an approved public or private agency. For this program the student should enroll in *Social Science 81* with the prior permission of the Chairman of the Department of Government. Further opportunity for similar research may be gained in Government 65.

Majors in *Government* are expected to meet all requirements of the General Liberal Arts curriculum (page 95). All major students are required to take Government 5, *Elements of Political Science* and Government 6, *Principles of American Government.* Students who expect to major in *Government* are advised to register for these courses during the freshman or sophomore year. Students majoring in Government are also required to complete a research paper approved by the staff. This project constitutes the chief part of *Research in Government Problems*, Government 65. A major consists of a minimum of 24 semester credits of work with grades of C or better in Government and in any related courses which may be approved by the supervisor and the College Dean. The 24 semester credits should include not less than 12 in courses above 50. Not more than 9 credits earned as an intern in *Social Science 81* may be counted toward the completion of the major requirements. Each student will be counseled individually and his program of study planned for his needs.

Students interested in electing *Government* as a major should meet with the supervisor, Professor J. T. Holden, Room 204, Morrill Hall.

History

History as a field in which to major, may be of interest to the following groups of students: (1) Those who wish to do college teaching in history. Graduate study is indispensable for such work, but preparation may be made for it by a certain amount of undergraduate specialization. (2) Those who plan to teach history in secondary schools. For such a position, training in other social studies is highly desirable, if not absolutely necessary. The student is therefore advised to keep in touch with the Department of Education, as well as with the Department of History, with a view to satisfying teaching certification standards and building a well-rounded program of studies. (3) Those who intend to enter other professional fields in which a considerable amount of historical knowledge is desirable. Such a field, for example, might be that of library training in which an historical preparation would rank with study in literature as a background, or the increasingly important profession of archivist. (4) Any students who feel free to plan the college program without too specific reference to a vocation, and who have a special interest in history.

Students who major in *History* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They must earn 24 semester credits in courses in History, with grades of C or better, exclusive of History 1, 2, which must include a minimum of six semester credits from *Group A* and a minimum of six semester credits from *Group B.* (See the description of courses offered by the Department.) A student who majors in *History* must prepare a satisfactory paper on a subject approved by the supervisor, in the student's field of concentration. The student must secure approval of the subject chosen, from the Chairman of the Department, before December 15 of the student's senior year and the completed paper must be filed with the Chairman of the Department before April 1 of the year in which the degree is to be granted.

Students planning to major in *History* should consult with the supervisor, Professor P. M. Marston, Room 204C, DeMeritt Hall.

History and Literature

Students who desire a broad education may take a combined major in *History and Literature.* Students who plan to enter library service may also find here a desirable major. The program of this major offers an opportunity to study the history and literature together of France, of Germany, or of Spain. A still broader survey of European history and of its literature is also possible. The program involves the completion of 24 semester credits with grades of C or better in one of the following groups of courses, of which 12 credits should be in History and 12 in Languages:

I History 9, 10, 19, 20, 83, 84;
Spanish 5-6, 51, 52, 55, 56, 65, 66;

II History 19, 20, 83, 84;
French 5-6, 51-52, 53-54, 55-56

III History 19, 20, 83, 84;
German 5-6, 53-54, 55-56, 57-58;

A student who has met the major requirements in *History and Literature* and other requirements of the General Liberal Arts Curriculum as listed on pages 95 and 96 will be recommended for the Degree of Bachelor of Arts with the notation "History and Literature" on the Commencement program.

Students' registration cards may be signed by either Professor P. M. Marston, Chairman of the Department of History, Room 204C, DeMeritt Hall, or Professor J. S. Walsh, Chairman of the Department of Languages, Room 119, Murkland Hall.

Students electing option I, II, or III, will be encouraged to do a considerable part of their reading for the History courses in Spanish, French, or German, respectively.

Languages

A major student in the Department of Languages may have a professional or cultural objective. Many majors plan to enter secondary-school or college teaching. For such students there is no hard and fast curriculum. The arrangement of Language courses is sufficiently flexible to meet the individual's needs. As most language teachers are obliged to teach more than one language, or one language in combination with other subjects, students should not plan to concentrate in a single language and its literature, but to map out a program including two languages (preferably French and Latin), or one language with a number of courses in English or History. Students who may desire departmental recommendations for teaching a modern language should include French 13-14, German 13-14, or Spanish 13-14 in their major programs. Prospective teachers should consult the Chairman of the Department, Professor J. S. Walsh, and Professor T. O. Marshall of the Department of Education. Some departmental majors plan to enter library service. Most library schools require two foreign languages.

Major students who do not plan to teach usually have a cultural objective. Here again the flexibility of the departmental offerings makes it possible to arrange individual programs for individual students. Some students find a special appeal in a single foreign literature and wish to explore it thoroughly. Others find that the study of two or three languages and literatures is a broadening and stimulating experience.

For non-majors, the Department offers practical courses which are a valuable aid to careers in foreign service (consular, diplomatic, commercial, military or naval), journalism (for international news, foreign books, and the like), interpreting, translating, travel agencies, radio announcing, etc. A knowledge of foreign languages is invaluable for the historian, the architect, the musician, the artist, the political and social scientist, and for any citizen who is interested in foreign affairs. The biologist, chemist, or physicist should always be able to read foreign articles and keep up with research in his field in foreign countries. As most graduate schools require a knowledge of one or two foreign languages, all students who may possibly do graduate work in any field should obtain a reading knowledge of French and German. The elementary courses in French, German, Italian, and Spanish are planned particularly to help students acquire an ability to read and to speak the respective languages; at the same time, through reading and oral work, the student learns something of the history, institutions, customs, and spirit of a foreign counry. Latin is the basis of all language study and the study of the Romance languages in particular.

For non-majors, there are offered three courses which are given in English. These courses offer, respectively, a survey of Greek and Latin Literature (in translations), a survey of Modern European Literatures (in translation), and an introduction to Romance Philology.

Students majoring in the Department of Languages are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95), and must designate *French*, *German*, *Latin*, *Romance Languages*, or *Spanish* as their particular major. Elementary courses (French 1-2, German 1-2, Greek 1-2, Italian 1-2, Latin 1-2, and Spanish 1-2) cannot be counted for major credit. A major in a single language (French, German, Latin, or Spanish) must comprise a minimum of 18 major credits in a particular language. The remaining 6 credits may be earned in other designated courses in the Department. A major in *Romance Languages* must comprise courses in both French and Spanish (not including French 1-2 or Spanish 1-2) with a minimum of 12 major credits in each.

The special supervisor for majors in *French* is Professor C. S. Parker; for majors in *German,* Professor A. P. Danoff; for majors in *Latin* and in *Romance Languages,* Professor J. S. Walsh; for majors in *Spanish,* Professor R. A. Casas. All offices of the Department of Languages are in Murkland Hall.

Attention is called to the combined major in *History and Literature.*

Mathematics

Over and above the benefits to be derived from the study of mathematics for its own interest, it is being recognized, ever more forcefully, that such study will give the student essential and invaluable equipment for any scientific pursuit. The courses in mathematics are intended to provide a sound preparation in the fundamentals of the subject, as well as to offer a sufficient variety of subject matter to meet diversified interests. Courses are designed to prepare the student who majors in Mathematics for opportunities in various fields. Among them are (1) work in statistics, such as government agencies, business, life insurance, and the application of statistics to problems in education, economics, sociology, psychology, medicine, and genetics; (2) teaching mathematics in secondary schools; (3) graduate study for those students who are interested and especially proficient in their undergraduate work; (4) many industrial opportunities requiring mathematics for research in applied problems and consulting work.

All students who major in Mathematics must meet in full the requirements of the General Liberal Arts curriculum (page 95), and must complete, with grades of C or better, at least 24 semester credits in Mathematics (exclusive of Math. 2, 3, 7-8, and 21), including Math. 62 and 68 (Math. 19 for those students who entered under 1957-58 and prior catalogues).

All students who are interested in a *Mathematics* major should consult with the supervisor. Professor D. M. Perkins, Room 105, DeMeritt Hall.

Music

The Department of Music offers a major program in the General Liberal Arts curriculum for students who desire to place an emphasis on music while pursuing a broad, general program of study. The study of music history, literature, and appreciation gives the student cultural values which should enrich his entire life. Music study tends to increase understanding and appreciation of other fields, including the fine arts, language, and literature. Instruction offered in the Department of Music is designed to develop musicality (appreciation and general comprehension of music form), musicianship (musical taste and scholarship), ability to perform, and capacity to teach, supplemented by the general education required by the College of Liberal Arts.

The University of New Hampshire is an associate member of the National Association of Schools of Music.

Instrumental instruction and vocal instruction are given in private lessons. Class instruction provides for the pursuit of academic music studies. Student recitals, instrumental and vocal ensembles, Men's Glee Club, Women's Glee Club, the University Concert Choir, the University Symphonic Orchestra, and the University Symphonic Band afford both laboratory and concert experience.

Students who major in *Music* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). *They must also earn grades of C or better in all courses of the Music major.* The Department of Music offers the student three options in concentration leading to the Bachelor of Arts degree with a major in Music. All students must take the basic theory courses, Music 9-10, the basic history-listening course, Music 37-38. The specific requirements of each option are given below:

I. An option stressing *Music History*: in addition to the above basic courses the following must be taken — 4 credits in advanced theory; 12 credits in advanced history and literature courses, 8 credits in Music 23 (Piano), and/or 26 (Voice).

II. *Applied Music* option, emphasizing training in voice, piano, organ, strings, woodwinds, and brass (a student choosing this option must take an examination before the staff of the Department of Music); in addition to the above basic courses the following must be taken — 4 credits in advanced theory or literature courses, 16 credits in Applied Music in principal field (2 credits per semester), a senior recital.

III. A *Theory* option stressing musical composition; in addition to the above basic courses the following must be taken — 12 credits in advanced theory, 4 credits in advanced history, 8 credits in Music 23 (Piano).

Prospective majors in *Music* are advised to consult with the supervisor, Professor K. H. Bratton, Room 101, Ballard Hall.

Philosophy

From the historical point of view, philosophy is particularly effective in unifying the various intellectual disciplines that make a Unversity. But philosophy also has its own distinctive method and subject matter. The courses in the Department of Philosophy reflect this division of function.

Students who are interested primarily in the history of ideas may select courses from a sequence which covers the history of philosophy from the early Greek philosophers to those of the contemporary world.

Students who prefer to concentrate on a more limited but more systematic and intensive study may choose from a sequence of courses covering the most important divisions of philosophy itself: logic and epistemology, metaphysics, ethics, philosophy of religion, and aesthetics.

Courses in the latter group make it possible to combine philosophy with other work in the humanities, especially the arts, English, and classical literature, and with appropriate work in the social sciences. Wherever it is possible, the work of the course is made relevant to other fields in which students may be concentrating.

Students in the following groups may find philosophy of particular value: (1) those who intend to undertake graduate work in some division of the humanities or in some branch of the social sciences; (2) those who intend to enter a theological school or seminary, or who intend to specialize in religious education.

At the present time, the Department does not offer a major in Philosophy.

Physics

The major in *Physics* is intended to prepare students for a diversity of interests in the application of this fundamental science. Broad in scope, the program provides electives so that a student may supplement his work in physics by that in other fields such as mathematics and the allied sciences. The intermediate courses are purely theoretical in nature and are intended to give the student a thorough grounding in fundamentals in a particular branch of physics. Some of these courses are supplemented by appropriate laboratory work illustrating some of the basic principles. Opportunity is given in the senior year for the major student to do some elemental investigation of his own choosing under guidance. Graduates of this major are eligible for employment in the various industrial, government, and armed services laboratories or they may continue study in the academic field leading to more advanced degrees.

Students who major in *Physics* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are required to complete 24 semester credits, in addition to the introductory courses, with grades of C or better, and *must elect Physics 18, 23-24 as the introductory course in place of Physics 1-2.* Since proper preparation in mathematics is essential to a good understanding of physics, the student should plan to elect in the freshman year, Mathematics 21-22 in order to have the necessary prerequisites for the courses that follow in both mathematics and physics.

Students who wish to major in *Physics* are advised to consult with the supervisor, Professor H. H. Hall, Room 103, DeMeritt Hall.

Psychology

Some students may wish to major in Psychology for the purposes of understanding themselves and others more adequately and of gaining knowledge of scientific methods of studying human behavior. Others may not have these aims in mind but also may wish to specialize in Psychology to prepare themselves for one of the following professional objectives: (1) college teaching; (2) personnel work in industry or government; (3) supervision of psychological testing in mental hospitals, juvenile courts, city school systems, child guidance clinics, and the Federal Civil Service; (4) counseling and guidance in secondary schools and colleges; and (5) clinical practice.

Students who contemplate major work in Psychology as a means of preparing for a profession should keep in mind the necessity of graduate work. For non-majors, a background of psychology will be an asset in teaching, nursing, social work, business and industrial management or in professions such as medicine and law in which human relations are of primary importance.

Students who major in *Psychology* are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95). They are required to complete 24 semester credits with grades of C or better in courses in Psychology and in such related courses as may be approved by the supervisor and the College Dean. Psychology 95, *Advanced General Psychology*, and Psychology 98, *Seminar in Psychology*, are required of all majors. Psychology 57, *Experimental Psychology*, and Psychology 67, *Statistics in Psychology*, should be taken by all psychology majors who are planning for graduate work. A comprehensive paper on a subject approved by the supervisor is required. This paper is the core project in Psychology 98.

Students who wish to major in *Psychology* are advised to consult with the supervisor, Professor H. A. Carroll, Room 202F, Conant Hall.

A graduate program of study is offered for those students who are interested in earning the Master of Arts degree in Psychology. (See the catalogue of the Graduate School for further information.)

Sociology

The major in *Sociology* is for (1) students who desire a liberal education with emphasis on study of the organization and differentiation of contemporary society, particularly study of the research methods developed in recent years for a better understanding of social phenomena; (2) students who intend to do graduate work in Sociology; and (3) students who plan to attend a graduate school of social work but prefer a broader choice of undergraduate electives than the prescribed Social Service curriculum permits.

The Social Service curriculum, with its field experience and its concentration on pre-professional courses, not only prepares students to enter graduate schools of social work but also has been quite successful, for a number of years, in preparing them for junior positions in social work prior to graduate study.

Students who wish to teach sociology in secondary schools are advised that such teachers usually have to teach related social studies. Students with this vocational aim should consult with Professor T. O. Marshall of the Department of Education.

Majors in *Sociology* are expected to meet all the requirements of the General Liberal Arts curriculum (page 95). It is recommended that they take Sociology 1-2, *Introductory Sociology: Principles and Problems*, during their freshman or sophomore years. In addition, they must complete a minimum of 24 semester credits with grades of C or better in Sociology (or in any related course approved by the supervisor and the College Dean). Sociology 89, *Development of Sociological Thought*, Sociology 92, *Fields of Sociology*, and Sociology 75, 76, *Methods of Social Research*, are required. At the end of the senior year they must pass a written comprehensive examination.

Students who are interested in choosing *Sociology* as a major should consult with the supervisor, Professor M. Nielson, Room 204G, DeMeritt Hall.

Zoology

Zoology is the science of animal life; the study of the structure, functions, development, and classificiation of the various animal forms. The student may major in Zoology (1) because of a general educational interest in the subject; (2) because of his avocational interest in nature study; or (3) to prepare for professional work in pure science or in applied zoology. Fish and game research, important in the conservation of our natural resources, is an example of applied zoology. Students who are interested in entering the fields of applied zoology should plan to secure advanced degrees since positions in these fields are difficult to obtain without graduate study. Undergraduate preparation for students who are interested in applied zoology generally should parallel that of any student planning to enter graduate work in Zoology. Students who are interested in Forest Game Management are advised to consider registration in the curriculum of that name offered by the Department of Forestry in the College of Agriculture.

The University of New Hampshire's location on tidewater and near the open ocean provides an unusual opportunity for the study of Marine Zoology and Marine Ecology.

All students who major in Zoology are expected to meet in full the requirements of the General Liberal Arts curriculum (page 95) with grades of C or better in 24 semester credits in Zoology. Related courses in other departments may be counted for major credit with the consent of the supervisor and the College Dean. Minimum course requirements for Zoology majors include: Zoology 7-8, Zoology 20 or 59, and Botany 3 or 6; eight of the 24 major credits must be in courses numbered 51-100. *Zoology majors are also required to present credit for Chemistry 3-4 and a course in Organic Chem-*

istry. (Chemistry 45, 51-52, or Biochemistry 1). These courses in Chemistry cannot be counted as part of the 24 major credits.

Students who are interested in a *Zoology* major are advised to consult with the supervisor, Professor W. L. Bullock, Room 107A, Nesmith Hall.

OTHER PROGRAMS OF STUDY

Although pursuing his studies in the College of Liberal Arts in one of the major fields just outlined, the student may also prepare himself for some related objective which he may have in mind. Two of these are described below and there is enough freedom of election to make it possible for the student, in consultation with his supervisor, to arrange others.

Pre-Dental

Students who plan to enter a school of dentistry may follow the Pre-Medical curriculum (page 86), or they may elect to major in almost any field offered under the *General Liberal Arts* curriculum (pages 67-81). The student's program should include courses in comparative anatomy, physics, and organic chemistry. Students who plan to enter a school of dentistry, either before or after achieving the bachelor's degree, are advised to consult with Professor W. L. Bullock, Room 107A, Nesmith Hall.

Pre-Law

While the various bar associations and law schools do not prescribe a specific undergraduate curriculum for future lawyers, they recommend that a student who contemplates entering law school should plan a study program which will develop breadth of view and facility of expression. They also urge him to acquire a background of information concerning the society in which he lives and the forces which have shaped modern institutions. They urge him particularly to perfect his use and understanding of the English language.

The courses considered most helpful are those which develop oral and written expression, deal with man's social, economic, and political institutions, provide an understanding of the human mind, and develop the art of thinking.

A number of law schools require the *Law School Admission Test* of students seeking admission; each law school will advise a student upon request whether or not he will be expected to take the test in partial satisfaction of admission requirements. Particulars of the examination may be obtained at the Department of Government, Morrill 204.

Students who plan to enter law school after graduation are advised to consult with Professor J. T. Holden, Room 204, Morrill Hall, as soon as they have made their decision.

PRESCRIBED CURRICULUMS

Several prescribed programs of study intended to provide preparation for business or professional life are available to students in the College of Liberal Arts. They are arranged in such a manner as to permit considerable specialization while conserving the breadth and general culture of the students enrolled in them. They are less broad and general, however, than the *General Liberal Arts* curriculum. They are definitely professional in character. All *Prescribed* curriculums lead to the degree of **Bachelor of Science.**

Business Curriculum

One curriculum with an option is offered in this field. (1) A curriculum for students who do not desire to specialize in any particular phase of business; (2) an option for those desiring to specialize in accounting. The Business curriculum provides for general education as well as for professional preparation in business subjects. For students interested in marketing and distribution, in finance, or in labor and personnel administration, a list of courses in these areas is offered. Students may choose electives from these groups. Many of the graduates of the *Business* curriculum are successfully filling responsible positions with accounting, banking, insurance, merchandising, and manufacturing concerns.

The *Business* curriculum is planned to emphasize foundation or general courses in the freshman and sophomore years with specialization coming largely in the junior and senior years. The program is outlined on pages 99 and 100. Students registered for this curriculum are held for the requirements expected of students in all Prescribed curriculums (page 97). Students pursuing the *Business* curriculum must obtain grades of C or better in 24 semester credits from the following courses; Business Administration 1-2, 21-22, 23, 34; Economics 1-2, 25, 31, 51, 53, 56; and English 35. Of the required courses in Economics and Business Administration, at least 12 semester credits shall be earned at the University of New Hampshire.

Students pursuing the *Accounting* option must obtain grades of C or better in 24 semester credits from the following courses: Business Administration 1-2, 3-4, 7-8, 21-22, 23, 55, 56, 57, 61, 68; Economics 1-2, 25, 31, 53, 56; and English 35. Of the required courses in Economics and Business Administration, at least 12 semester credits shall be earned at the University of New Hampshire, and at least six of these semester credits shall be in accounting courses.

Students interested in registering for the *Business* curriculum or the *Accounting* option should consult with the Chairman of the Department, Professor A. W. Johnson, Room 212, Morrill Hall. Those who elect either of the curriculums will be assigned to a member of the department staff who will act as supervisor for the duration of the student's course.

Hotel Administration Curriculum

Young men and women to whom a career in hotel or food service management makes an appeal are invited to follow this curriculum. The inevitable condition of final success is arduous and continuous application, both mental and physical, to those many tasks actually performed in the operation of the business. There is no substitute for the practical experience gained in on-the-job training to provide the skills which make the background of the future executive.

A degree from this or any college is definitely not an indication of preparedness for a management position. There is no thought here even to train a student for a specific hotel job, rather the curriculum is designed to provide him with some appreciation of the wide variety of subject matter demanded of today's hotel executive. In addition, work in the humanities, the social and physical sciences, aims to assist him to take his place in a world in which he will enjoy working and living.

The curriculum is so specialized that three college years are needed to fulfill the requirements. *Regular students should enter the curriculum no later than the fall semester of the sophomore year. Students transferring to the program after the sophomore year can expect to complete the requirements in two years only if they offer substantially the required work of the first two years as shown in the program of study.*

The basic work comprises four main divisions: Foods, Engineering, Accounting, and Hotel Management Problems. About three-fourths of the total curriculum is prescribed by the requirements of the Department together with the University and College requirements, leaving about one-fourth of the time open for electives in allied subjects or others of the student's choice.

To be graduated from the *Hotel Administration* curriculum, a student must have completed satisfactorily the requirements for all Prescribed curriculums (page 97), the courses as detailed on page 101, and further he must have attained a cumulative grade point average of 2.4 or better in the following courses: Business Administration 9-10; Electrical Engineering 31; Hotel Administration 5, 26; Home Economics 15-16, 51-52; and Mechanical Engineering 40.

To make certain that the hotel administration program contains some experience under working conditions, *each student is required to secure before graduation a minimum of 20 points of hotel practice credit in addition to the scholastic requirements of the curriculum. This will be achieved through work in hotels where supervision will be authorized, regular reports submitted by the students, and the grade of work reported by the employer. Each week of work will constitute one point. Not more than 12 points may be secured for any one type of work performed, nor more than 20 points from a given hotel.*

Students interested in *Hotel Administration* are advised to consult with the supervisor, Professor R. R. Starke, Room 105, Conant Hall.

Medical Technology Curriculum

There is now a large and increasing demand for medical technologists. Public health and medicine depend more and more upon the laboratory. Professional technicians are needed to perform various laboratory techniques and tests, such as blood typing, blood counts, tissue sections, urinalyses, and bacteriological and serological tests. Positions in this field are available in hospital laboratories, physicians' and surgeons' clinics, and in health department laboratories.

Students who are interested in becoming medical technologists should register in the Prescribed curriculum in *Medical Technology.* In this program students will take their freshman, sophomore, and junior years' work at the University and their last year's work at the Mary Hitchcock Memorial Hospital School of Medical Technology, Hanover, New Hampshire. After satisfactorily completing the courses at the School of Medical Technology (Biology 61-62), the student is awarded 32 credits toward the Bachelor of Science degree. This program also qualifies the student for the examination for the Medical Technologist's certificate administered by the Registry of Medical Technologists of the American Society of Clinical Pathologists. Thus a student can obtain the B.S. degree from the University and the M.T. certificate in a four-year period. Students who complete this curriculum are well qualified for work in any hospital, or medical laboratory (see page 102).

Students in the Medical Technology curriculum are held for the requirements expected of students in all Prescribed curriculums (page 97). They must also obtain grades of C or better in 24 semester credits from the following courses: Zoology 17, 20; Bacteriology 1, 8, 53; Chemistry 17, 45; and Biochemistry 56.

Students who in their junior year decide not to take the training program at the Mary Hitchcock Memorial Hospital School of Medical Technology will find it possible to transfer to a major in the General Liberal Arts curriculum, such as Bacteriology or some other biological science. In such case, they would have to satisfy a language requirement which may be met by passing a reading test based on two years of language taken in high school or one year of college language.

Students interested in the Prescribed curriculum in *Medical Technology* are advised to consult with the supervisor, Professor L. W. Slanetz, Room 215, Nesmith Hall.

Nursing Curriculum

Any student who is interested in nursing as a career is encouraged to consider the Nursing curriculum. It affords opportunity for examinations for registration as a nurse and enables the matriculant also to secure a college degree. The breadth of training beyond that usually received in a hospital training school is increasingly in demand, particularly for those who aspire to executive or supervisory positions. The curriculum prepares for nursing and also permits the student some specialization in other fields related to nursing (see page 103).

The student must satisfactorily complete three years of work (a minimum of 96 credits) in residence at the University of New Hampshire with a minimum cumulative grade point average of 1.8, and graduate from a school of nursing approved by the University. The length of the training period will vary with the several schools of nursing.

A student registered in the curriculum is held for the requirements expected of students in all Prescribed curriculums (page 97). *This curriculum is intended to precede hospital training.*

Students interested in selecting the *Nursing* curriculum are advised to consult with the supervisor, Professor E. T. Richardson, Room 104, Nesmith Hall.

Occupational Therapy Curriculum

An ally to the medical profession, occupational therapy is any activity, mental or physical, prescribed by a physician and administered by a registered therapist to aid in the recovery or the rehabilitation of the patient.

The successful practice of occupational therapy requires not only thorough academic preparation but also suitable personality combined with judgment, dependability, tact, tolerance, patience, and will to serve. A high degree of mental and physical health is essential. Occupational therapy requires physical vitality and emotional stability.

The course admits both men and women who can meet entrance requirements.

Before the beginning of the sophomore year, in the case of freshman students who are interested in the Occupational Therapy curriculum (or before admission into this curriculum in the case of students who transfer from *other majors or from other colleges), a series of tests will be given to assist the supervisor in advising the student of his or her fitness for entering this curriculum.* (See page 104).

Because of the highly specialized nature of the Occupational Therapy curriculum, students are advised to enter this program not later than the beginning of their sophomore year; otherwise, they should expect to spend additional time in working toward the Bachelor of Science degree.

The curriculum in Occupational Therapy is designed to satisfy the requirements of the American Medical Association as well as to offer a four-year course leading to the Bachelor of Science degree. This includes the theoretical subjects needed in the medical fields as well as a wide range of crafts and skills used in therapy and recreational, educational, and pre-professional subjects.

It is recommended that each student interested in the Occupational Therapy curriculum spend one summer in an occupational therapy department in either a hospital or a children's camp. This should be done before the student enters the clinical affiliation program.

At the completion of the requirements of the curriculum, the student will spend a minmum of ten months in student affiliations in approved hospitals or services under the direction of a registered occupational therapist. *When this internship is satisfactorily completed, the student is entitled to a Certificate of Occupational Therapy.* The student is then qualified to take examination for registry in the American Occupational Therapy Association. The standard examination is sent out by the Association and administered by the University. A fee of $10 is required by the Association for each examination. While the present demand for qualified therapists is far in excess of the supply, there are relatively few job opportunities for those who have not completed the requirements for and entered the Registry of the American Occupational Therapy Association.

A student affiliation fee of $75 for residents of New Hampshire and $150 for non-residents of the state is payable to the University by those students who enter the clinical affiliation program.

Ten months of student affiliations in approved hospitals is divided as follows:

Psychiatric conditions — three months

Physical disabilities (surgical, neuromuscular, and orthopedic) — two months

Tuberculosis — two months

Pediatrics — one month

General medicine and surgery — one month

One month of additional work in one of the above fields as arranged by the student and the supervisor.

The American Medical Association requires a physical examination including a tuberculin test prior to hospital affiliation.

Expenses vary during the period of student affiliation. Room, board, and laundry are given students by some hospitals; meals only in other hospitals; while some offer affiliations only. *In all cases, the University must approve living arrangements for student affiliates.* Students will furnish regulation uniforms which are required for student affiliation.

Students who are registered in the curriculum are held for the requirements expected of students in all Prescribed curriculum (page 97), and in addition must obtain grades of C or better in the following courses: Zoology

17, 19, 20, 64; Occupational Therapy 41, 42, 44, 46, 49-50. Students interested in the curriculum are advised to consult with the supervisor, Professor Anne Henderson, Room 216, Hewitt Hall.

Pre-Medical Curriculum

Young men and women who are interested in careers as physicians or surgeons may select the Pre-Medical curriculum. Students who successfully complete this curriculum will be eligible for admission to Class A medical schools. However, owing to the large number of applicants for admission to medical schools, usually only those students who stand in the upper third of their class can expect to be admitted.

It is highly desirable that a pre-medical student secure a Bachelor's degree, although some medical schools do not require it as a condition of admission. The four years of pre-medical work will not only give the student a foundation for his future medical training, but will also give him an opportunity to secure the broad general education he needs.

The curriculum is outlined in detail on page 105. Students registered in it are held for the general requirements of Prescribed curriculums (page 97). *Students pursuing the Pre-Medical curriculum must obtain a grade point average of 2.5 or better for the required courses in Biology, Chemistry, Physics, and Zoology.*

Students who are interested in this curriculum should consult with the supervisor, Professor G. M. Moore, Room 101, Nesmith Hall.

Secretarial Curriculum

A large number of college women find pleasant and profitable employment in secretarial positions in private, professional, commercial, and industrial offices. Although in most cases the initial appointment is to a subordinate position in an office organization, the breadth of the college education plus the secretarial skills acquired during the college course give opportunity for early assumption of greater responsibility.

Although the curriculum is essentially semi-professional, it provides for a rather liberal number of electives with which to secure the general education so essential to success.

Women students who are interested in other aspects of business are advised to consider the Business curriculum and those interested in less specialization are counseled to consider a major in Economics in the General Liberal Arts curriculum.

Women who are preparing to teach commercial subjects in high school should consult the description of the Commercial Teacher Preparation program which appears on page 90.

The Secretarial curriculum is outlined in detail on page 106. Students registered in it are held for the general requirements expected of students in all Prescribed curriculums (page 97). Secretarial students must earn grades of C or better in the following courses: Secretarial Studies 3-4, 9-10, 17; Secretarial Studies 11, 13, 18 (unless excused in accordance with the statement below). In addition, secretarial students must earn at least a C grade in 4-11 credits (to make a total of 24 semester credits) of work in the following courses: Secretarial Studies 22, *Advanced Transcription;* Secretarial Studies 23-24, *Business Writing;* Economics 3, *Economic and Commercial Development of the U.S.;* Business Administration 1-2, *Elementary Accounting;* Business Administration 21-22, *Commercial Law;* or Business Administration 24, *Introduction to Business.*

Students transferring from collegiate institutions and high-school students with previous training in secretarial subjects are required to take the following courses: Secretarial Studies 3-4, 9-10, 17; Secretarial Studies 11, 13, 18 (unless excused). These students may be excused from:

Secretarial Studies 11 by passing a 40-period certificate test.

Secretarial Studies 13 by passing a theory and practice test on each of the machines taught.

Secretarial Studies 18 by giving satisfactory evidence of having done acceptable secretarial work in a business office for one year. "One year" shall be interpreted as not less than 50 weeks of full-time work. Full-time work done continuously for two weeks or more may be counted toward a year's work. Part-time work of less than 30 hours a week may not be considered. Only part-time work of 30 hours a week or more done continuously for at least 6 weeks may be counted toward a year's full-time work. The number of hours of acceptable part-time work will be divided by 40 to find the equivalent number of weeks of full-time work. *(Work done for relatives will not be considered.)*

Transfer and high school students who have had one year of Gregg shorthand (or the equivalent of one year) in another institution and have earned a grade of 80 or better (where the passing grade is 70) will not be allowed to enroll in Secretarial Studies 1 for credit; likewise, those students who have had one year of typewriting (or the equivalent) in another institution and have earned a grade of 80 or better (where the passing grade is 70) will not be allowed to enroll in Secretarial Studies 7 for credit (see below).

Secretarial students who have had Secretarial Studies 5 in the University of New Hampshire or a similar course in another collegiate institution, or one semester of typewriting in high school or preparatory school, will be required to enter Secretarial Studies 27 instead of Secretarial Studies 7.

Students registered in this curriculum are held for the general requirements expected of students in all Prescribed curriculums (page 97). Students interested in registering for the *Secretarial* curriculum should consult with Professor Doris E. Tyrrell, Room 4, Morrill Hall.

Social Service Curriculum

Social service includes, among others, the following fields: family case work, child care, child placement, settlement and neighborhood house, institutional work for defectives and dependents, state and local welfare work, probation, correctional school and prison service, Y.M.C.A. and Y.W.C.A. service, municipal playground direction, child guidance clinics, community chest work.

For full recognition in social service, it is important for a man or woman to have completed the two-year professional course in a graduate school of social work. The best preparation for admission to such a graduate school is either (1) a broad liberal arts education with 40 to 60 hours of credit in the social sciences, including a major in Sociology, or (2) the *Social Service* curriculum. For able students, scholarship aid toward meeting expenses of graduate study is sometimes available.

There is a continuing serious shortage of qualified workers in nearly all the branches of social work. For this reason, a number of students who complete the *Social Service* curriculum find employment each year, in public welfare, group work, etc., before they commit themselves to graduate study. The program is outlined in detail on page 107. Students registered in it are held to the general requirements of all Prescribed curriculums (page 97), and in addition must obtain a grade of C or better in 24 semester hour credits from the following courses: Sociology 43, 44, 71, 72, 73, 74, 75, 76, and 97.

Students interested are advised to consult with the supervisor, Professor M. Nielson, Room 204G, DeMeritt Hall.

PREPARATION FOR TEACHING

UNIVERSITY TEACHER PREPARATION CURRICULUM

The University of New Hampshire has accepted the responsibility of preparing teachers for the secondary schools of New Hampshire and neighboring states. Two types of teacher preparation programs are offered. *General Liberal Arts* curriculum students may follow an advisory program of studies called the University Teacher Preparation program. There are also *Prescribed* curriculums preparing teachers in the fields of Agriculture, Art, Home Economics, Music, and Physical Education. (See following pages.) Students interested in preparing for teaching are urged to become thoroughly familiar with the requirements of all the Teacher Preparation programs before they make a choice of a particular program. *This section of the Catalogue includes descriptions of Teacher Preparation Programs offered by the University, not merely those offered by departments in the College of Liberal Arts.*

Courses in Problems in the Teaching of High-School Subjects

The courses in problems in the teaching of high-school subjects are listed on page 164 and are open only to students who have completed the course *Planning for Teaching in High School* (Education 58) in addition to the courses in the subject and related subjects designated as prerequisites.* From these courses in Problems in the Teaching of High-School Subjects the student who plans to complete the University Teacher Preparation curriculum selects his course in the field of his teaching major. *To be eligible for Supervised Teaching in a subject, the student must complete the course in the problems of teaching that subject with a grade of at least C.*

Courses in Supervised Training

The work in Supervised Teaching is under the direction of the Coordinators of Student Teaching. Students teach under the immediate direction of selected classroom teachers in high schools approved by the University.

In the Supervised Teaching courses the student participates in the conduct of class exercises and in the control of the classroom, at first chiefly as an observer, but gradually entering into teacher responsibilities until complete charge of the classroom is assumed.

This work is required in the University Teacher Preparation programs, but will be open only to students whose applications are approved by the Chairman of the Department of Education and the Coordinators of Student Teaching in the subject or subjects in which the applicant desires to do supervised teaching. *Applications should be filed in the office of the Department of*

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* Except for Agriculture-Education 92, Home Economics-Education 91, and Physical Education-Education 91.

Education on or before November 15 of the academic year in which the supervised teaching is to be done. No application will be considered unless the applicant has completed with a grade of at least C the following courses in Education: 41, 42, 52, 58, and has superior grades in at least 18 semester credits in the subject matter field in which he desires to teach under supervision.

The applicant must also complete with a grade of at least C a course in the problems of teaching the subject in which he desires to do supervised teaching.

PRESCRIBED CURRICULUMS IN TEACHER PREPARATION

Agriculture Teacher Preparation Curriculum

A student electing the Teacher Preparation curriculum in Agriculture must meet the general and specific requirements for a degree described on pages 35 and 36 applicable to all students registered in the College of Agriculture. His course of study will follow a broad general program rather than a specialization in any particular field. Furthermore, he must meet the state requirements for certification which include one semester of practice teaching, 14 additional credits of courses in Education, and 8 credits of Agricultural Engineering. In addition he must have had a farm upbringing prior to enrolling in the Teacher Preparation curriculum in Agriculture, or two years of agricultural experience, one year of which must have been continuous in a standard commercial farm enterprise.

There is a rapidly increasing demand for teachers of agriculture in our secondary schools. Local school boards are beginning to appreciate more fully the value of instruction in agriculture, both for the boys who will engage in agriculture after leaving high school, and as electives to maintain the interest of those young men who may wish to take at the University further education in this basic industry. As a result, there are a good many positions open for young men who wish to make the teaching of agriculture their profession.

For the suggested program for the sophomore, junior, and senior years, see page 53).

Art Education Curriculum

This curriculum is designed to prepare teachers and supervisors of art in the public schools. It is based upon the new demands for teachers who possess developed skills in the arts and a broad general culture in addition to a specialized preparation in Art Education. The satisfactory completion of the curriculum will satisfy the initial certification requirements for teachers of art in the public schools in New Hampshire and in other states maintaining certification requirements.

Freshmen who plan to enter this curriculum should elect *Basic Design* and *Drawing and Design* (Arts 23-24) in their first-year program.

A grade of C or better must be achieved in all Arts courses required in the curriculum.

Students who wish to prepare themselves to teach other subjects in addition to art can do so by using their elective hours for this purpose. Such a program should be worked out in consultation with Professor T. O. Marshall of the Department of Education.

Students registered in the curriculum (see page 108) are held for the general requirements expected of students in all Prescribed curriculums (see page 97).

Interested students should consult with the supervisor, Professor G. R. Thomas, Room 218. Hewitt Hall.

Commercial Teacher Preparation Program

This program is an option in the Prescribed Secretarial curriculum and is not a Prescribed curriculum in itself.

Students preparing to teach commercial subjects in high school should include in their freshman programs Secretarial Studies 7-8 and electives from Group III; in their sophomore programs, Secretarial Studies 1-2, Business Administration 1-2, and 24, Economics 3, Education 41, 42, and an elective from Group I; in their junior programs, Secretarial Studies 3-4, 9-10, 13, and 23-24, Business Administration 21-22 and Education 52, and 58; in the Summer Session between their junior and senior years, Commercial Subjects-Education 91, *Problems in the Teaching of Commercial Subjects in the High School.* Such students should enroll for 18 semester credits in at least one semester in order to have the second semester of the senior year free for supervised teaching.

Interested students should consult with the supervisor, Professor Doris E. Tyrrell, Room 4, Morrill Hall.

Home Economics Teacher Preparation Curriculum

This curriculum is designed to prepare teachers of Home Economics for the secondary education program. See page 62 for the program outlined for Teacher Preparation in Home Economics. Satisfactory completion of this curriculum will meet the certification requirements for teachers of Home Economics in the public schools in New Hampshire and in several other states having certification requirements.

The curriculum is outlined in detail on page 62. Students who are interested should consult with the Chairman of the Department of Home Economics, Professor Anna L. Smith, Room 209, Pettee Hall.

Music Education Curriculum

This curriculum is designed to prepare teachers of music for the public schools. It is based on the new demands for teachers possessing sound musicianship and a broad general culture in addition to a specialized preparation in Music Education. This curriculum satisfies the initial certificate requirements for teachers of music in the public schools in New Hampshire and in most other states.

To be admitted to this curriculum the student must give evidence of having a sound musical background. *Freshmen who plan to enter this curriculum must meet the requirements of Music 9-10 and elect four hours of Applied Music in their first year program.*

A grade of C or better must be achieved in all Music courses required in the curriculum.

Public school music teachers must maintain a satisfactory standing musically with other professional musicians in the community and should be able to play or sing acceptably. For this reason *16 semester credits in Applied Music are required before graduation.* Students will be encouraged to accumulate up to eight semester credits in any one instrument or in voice. In addition, all candidates are required to meet minimum standards of performance in piano, voice, a woodwind instrument, a brass instrument, a string instrument, and percussion. Candidates are expected to meet the piano and voice requirements by the end of their junior year. The minimum instrumental standards may be met by special examination, or may be demonstrated during the time the candidate is registered for Applied Music in these instruments. Details of minimum standard of performance may be obtained from the Supervisor of the Music Education curriculum.

Recitals. Students enrolled in the *Music-Education* curriculum must accumulate a minimum of 24 points in the sophomore, junior, and senior years. Attendance at each concert or recital constitutes one point.

Students registered in this curriculum are held for the general requirements expected of students in all Prescribed curriculums (page 97). The curriculum is outlined in detail on page 110. Students who are interested should consult with the supervisor, Professor D. M. Smith, Room 106, Ballard Hall.

Physical Education Teacher Preparation Curriculum (Men)

For men students who plan to prepare themselves for positions as teachers of physical education or directors of physical education, the University has organized the Physical Education Teacher Preparation curriculum for Men (see page 112). This curriculum will enable men to prepare themselves to teach in two subject matter fields as well as in physical education. *It is open to men who have satisfactorily completed the freshman year, and are approved by the Department of Physical Education for admission to Physical Education as a field of concentration.* A grade of C or better must be achieved in Physical Education 23, *Principles of Physical Education;* Physical Education 61, *Problems of Teaching in Physical Education;* Physical Education 65, *Administration of Physical Education in Secondary Schools;* and in 24 semester credits in the second teaching major.

This curriculum requires the satisfactory completion of a second teaching major of 24 semester credits and a teaching minor of 12 semester credits in subjects taught in high school. Students registered in this curriculum are held for the general requirements expected of students in all Prescribed curriculums (page 97). Students who are interested in this program should consult with the supervisor, Professor C. Lundholm, Room 5A, Field House.

Physical Education Teacher Preparation Curriculum (Women)

For women students who plan to prepare themselves for positions as teachers of physical education or for positions in recreation education, the University has organized the Physical Education Teacher Preparation curriculum for Women (see page 114). This curriculum will enable women to elect, at the end of the sophomore year, the *Physical Education option* or the *Recreation Education option.* Furthermore, students have the opportunity, if they so desire, to prepare themselves to teach in a subject matter field as well as in physical education. Finally, those interested in going into physical therapy after leaving the University may by petition make approved substitutions in the program. The curriculum is open to women who have satisfactorily completed the freshman year and are approved by the Department of Physical Education for Women for admission to that field of concentration. It provides an opportunity to teach physical education and to assist in recreation programs, under supervision, in nearby schools and recreation centers.

Students in this curriculum who are planning to teach in areas in addition to physical education are required to complete with an average grade of C or better a second teaching major of 18 semester credits in subjects taught in high schools.

For students choosing the *Physical Education option*, the following courses offered by other departments are suggested as valuable electives: Arts 4, *Crafts;* Bacteriology 5, *Public Health and Sanitation;* English 35, *Public Speaking;* Home Economics 84, *Personal, Family, and Community Health;* Music 37-38, *Introduction to Music Literature;* Psychology 37, *Developmental Psychology;* Psychology 47, *Mental Hygiene;* Sociology 1-2, *Introductory Sociology: Principles and Problems;* Sociology 43, *Urban Sociology.* Physical Education 24, *Organized Camping*, is also recommended. Students in this curriculum are advised to choose non-professional electives whenever possible. Those planning to enter graduate study should elect a foreign language.

In the Physical Education option a grade of C or better must be achieved in 24 semester credits in the Physical Education courses required by the curriculum. A minimum of one summer as a camp counselor or playground leader is highly recommended for students choosing the Physical Education option.

Students choosing the *Recreation Education option* are advised to become skilled in at least two of these five fields: art, drama, music, outdoor education, or physical education. The following courses offered by other departments are suggested as valuable electives for recreation specialists: Arts; English 35, *Public Speaking;* Government 6, *Principles of American Government;* Music 23, *Piano;* Music-Education 90, *Problems in the Teaching of Elementary School Music;* Psychology 47, *Mental Hygiene;* Psychology 63, *Differential Psychology*; Sociology 33, *Cultural Anthropology*, Physical Education 56, *Health Education*, and Physical Education 63, 64, *Theory of Team Sports*, are also recommended.

Recreation Education students desiring a major emphasis in Forestry Recreation and outdoor education are advised to take Forestry 61, 62, *Problems.* Those interested in a major emphasis in Hospital Recreation are advised to take Zoology 19, *Kinesiology*, and Physical Education 55, *Remedial Gymnastics.*

To make certain that the *Recreation Education* option contains some experience under working conditions, each student is required to secure before graduation a minimum of 8 points in actual leadership of recreational activities in such places as community centers, institutions, hotels, playgrounds, hospitals, and camps where supervision will be authorized. A record of such activities will be kept by the student and submitted to the supervisor of the curriculum for crediting. Each week will constitute 1 point.

The students in the Recreation Education option must complete, with a grade of C or better, 24 semester credits in the physical education, arts, music, outdoor education, and drama courses offered by the curriculum.

Under Physical Education 1, 2, 3, 13, 4, 14, 5, 6, Physical Education students are required to include certain activities in the section reserved for students in the P.E.T.P. curriculum. *During the freshman* (or sophomore) *year* the student must register for one quarter each of the following, preferably in the order listed: hockey, tennis, basketball, badminton, volleyball, skiing, softball, and archery; *in the sophomore year*, tennis (intermediate), hockey, figure skating, stunts and tumbling, skiing (elementary), archery (intermediate), angling and campcraft, elementary games; *in the junior year*, golf, folk and square dance, modern dance (elementary), modern dance (intermediate). In addition, gymnastics is taken in the senior year.

For those who are quite highly skilled in the activities mentioned, substitutions may be made with the approval of the supervisor. Further dance and other activities not listed are included in courses for students in the Prescribed curriculum.

Students who are following any Teacher Preparation curriculum in the University are urged to include for Physical Education: American country dancing, folk dancing, social recreation, hockey, basketball, volleyball, and softball.

Students registered in this curriculum are held for the general requirements expected of students in all Prescribed curriculums (see page 97). The curriculum is outlined on pages 114-115. For further information concerning this curriculum consult with the supervisor, Professor Marion C. Beckwith, Room 101A, New Hampshire Hall.

Guidance of Students Preparing to Teach

Students who come to the University of New Hampshire for the purpose of preparing themselves for the teaching profession should consult with the Chairman of the Department of Education early in their freshman year. Other students who are seriously considering teaching as a possible profession are urged to consult the Chairman of the Department of Education before making a decision.

While the University has organized curriculums designed to prepare students for the profession of teaching, it also recognizes that it is important that students be prepared to meet the teacher certification requirements of the states in which they may desire to teach. The Department of Education endeavors to keep its files of teacher certification requirements up to date. Students preparing to teach in states other than New Hampshire should, before the close of their sophomore year, consult the Department of Education concerning the requirements of the states in which they desire to teach and the most effective ways of meeting those requirements.*

A PLAN FOR INDEPENDENT STUDY

In order to stimulate the superior student and to develop his initiative, the Faculty of the College has approved a plan for independent study which will permit *seniors who have demonstrated superior ability* to take a special program replacing in part courses usually taken in the senior year. Independent study enables a student *to pursue intensive work in a limited field of study or to integrate the subject matter of two or more fields.*

(1) A senior in the College of Liberal Arts may register for not less than 6 or more than a total of 12 semester credits of *Independent Study* for the year, provided: (a) his cumulative academic average at the end of his junior year is 3.0 or better, and (b) he has submitted a plan for Independent Study that has been approved by his Supervisor and the Dean.

(2) *This student shall be called a College Scholar.*

(3) A College Scholar may not carry more than 18 semester credits per semester and is not relieved of any University, College, or Prescribed curri-

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* The requirements of the State of New Hampshire are 21 semester credits in education courses, including 6 semester credits in supervised student teaching, and 18 semester credits in one or more fields usually taught in secondary schools. For detailed information concerning requirements, consult the Department of Education, Room 3, Murkland Hall.

culum requirements. Independent Study credits may at the discretion of the Supervisor be submitted in whole or in part for major course requirements in the *General Liberal Arts* curriculum or for elective credits in a *Prescribed* curriculum.

(4) A College Scholar will be assigned for guidance to a member of the staff of his major department or Prescribed curiculum.

(5) A College Scholar may either (a) work upon a project involving individual work, such as a long essay, a series of experiments, gathering and interpretation of data, creative writing, etc., or (b) prepare for a special comprehensive examination. *(Such special comprehensive examination or paper may not be substituted for a required departmental comprehensive examination or paper.)*

(6) The result of a College Scholar's activity under the program of Independent Study will be judged by three members of the Faculty, appointed by his supervisor from the staff of his department or curriculum or from related departments or curriculums or from both. (See page 197 for registration.)

REQUIREMENTS FOR DEGREES

The degree of **Bachelor of Science** is conferred upon those students in the College of Liberal Arts who successfully complete the requirements of a *Prescribed* curriculum. The degree of **Bachelor of Arts** is conferred upon all students in the College of Liberal Arts who successfully complete the requirements of the *General Liberal Arts* curriculum.

A student's candidacy for a degree will be determined by his satisfaction of the University, College, major, or curriculum requirements in force at the time of his admission to the College either as a beginning student or a transfer. A student may petition to satisfy the University, College, major, or curriculum requirements that may be in force at any time during his residence. Such a student shall be held, however, for *all* the academic requirements of the catalogue under which he seeks a degree; not a portion thereof. *The new catalogue becomes effective on July 1 of each year.*

Each candidate for a degree in the College of Liberal Arts must complete successfully 128 semester credits, and achieve a 1.8 *grade point average* in all courses completed in the University. In addition, he must complete the requirements given below and those of the major field, or Prescribed curriculum, as stated in the preceding pages. **Each student shall submit an application for a degree, bearing the signature of his supervisor and the College Dean, 12 months prior to the expected date of graduation.**

A. General University Requirements

Physical Education for men	Freshman year
Physical Education for women	Freshman, sophomore, and junior years
R.O.T.C. for men	Freshman and sophomore years

B. General College Requirements

1. Special Requirements of the Freshman Year
(If not completed in the freshman year, they must be taken as soon as available.)
   - *a. English 1-2, *Freshman English*
   - *b. A biological science (Biology 1-2) or a physical science (Chemistry 1-2; or 3-4†; Geology 1-2; Mathematics (2), (3); or 7-8; Physical Science 1-2; Physics 1-2‡).
2. Special History Requirement *(to be taken in the freshman year except students who are registered for the freshman program of the Medical Technology curriculum)*
   *History 1, 2, *Introduction to Contemporary Civilization.*
3. All freshmen in the College of Liberal Arts are assigned on registration to advisers who counsel them until they have officially selected major departments or Prescribed curriculums. Official declaration of a major or a prescribed curriculum is accomplished by a special form which must bear both the adviser's and the supervisor's signatures.
4. Students in both the *General Liberal Arts* curriculum and *Prescribed* curriculums are advised against over-specialization. Although no attempt is made to limit by regulation the number of courses in a major or the professional courses in a Prescribed curriculum, more than 36 semester credits in courses in the major department, or more than 66 semester credits in professional courses in a Prescribed curriculum, are deemed to constitute excessive concentration. Supervisors will counsel students who seem to be concentrating to their detriment to elect courses more likely to contribute to the breadth of their education. The Dean of the College will consult with the supervisors with regard to over-specialization as it may appear in the programs of individual students.
5. Students are advised that a limited amount of credit earned in music organizations may be counted toward a degree. See Music Organizations in the Description of Courses.

C. General Liberal Arts Curriculum Requirements

Each candidate for a degree in the *General Liberal Arts* curriculum must satisfy (1) the General University Requirements, (2) the General College Requirements listed below and those of the major as described in preceding pages.

1. Special Language Requirement

   All students pursuing the *General Liberal Arts* curriculum are required to pass a test of reading ability in Classical Greek, French, German, Italian, Latin, or Spanish. (Graduates of normal schools or teachers colleges who are pursuing the *General Liberal Arts* curriculum for a degree in the field of elementary education are exempt from the language reading requirement.) One year of college study or two years of high school work (or equivalent practical experience) are generally adequate preparation for this examination provided the student's experience in the language is recent. The examination is based on achievement of students after one year of college or two years of high school work and is a test of reading ability. It does not require translation into the foreign language, nor does it test vocabulary out of context.

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* Not counted toward fulfillment of *Major or Group requirements.*

† Chemistry 3-4 is required for pre-medical students and all who intend to take advanced work in chemistry.

‡ Students who expect to major in Physics should not register for Physics 1-2, but should elect Mathematics 21-22, and Physics 18, to be able to schedule Mathematics 23, 24, and Physics 23-24 in the sophomore year.

In the event a student does not pass the reading examination, he must make a written application for permission to repeat the examination, showing that he has improved his preparation. This improvement may be made through registering for a course or through tutoring or supervised study. Application forms are available in the office of the Department of Languages, Murkland 118. The reading examinations are given three times a year: during Orientation week, before the examination period in May, at the end of the Summer Session. (and at the end of January *by petition* for those graduating in February).

2. GROUP REQUIREMENTS

A student whose major is included in Groups I, II, or III shall present for the satisfaction of that group requirement some course outside of his major field, one not offered in fulfillment of any other college requirement. *A student may not offer in fulfillment of the Group I requirement the elementary course in the language in which he satisfies the special language requirement.*

I. A student must successfully complete a year's work (two sequential semesters) in this group.

a. Arts 31, 32
b. English 13, 14, or 15, 16
c. Humanities 1-2
d. Languages
e. Music 37-38
f. Philosophy 1, 2

II. A student must successfully complete a year's work (two sequential semesters) in this group (students electing a biological science during their freshman year must elect a physical science during their sophomore year, or *vice versa*):

a. Biological Science (Biology 1-2)
b. Physical Science (Chemistry 1-2; or 3-4; Geology 1-2; Mathematics (2), (3); or 7-8; Physical Science 1-2; Physics 1-2.

III. A student must successfully complete at least 6 semester credits of course work in this group.

a. Economics
b. Government
c. Psychology
d. Sociology

3. Divisional Requirements

   The student must meet such divisional requirements as may be established in the division in which he is majoring.

4. Major Requirements

   Each student pursuing the *General Liberal Arts* curriculum may select at the end of the second semester of the freshman year, and shall select not later than the end of the second semester of the sophomore year, a major department in which he shall pass courses to a total of 24 semester credits with grades of C or better. Courses in other departments closely related to the major courses may be counted with the consent of the major supervisor and the College Dean. Departments shall designate in the catalogue in their description of courses those which will not count for major credit. In addition to satisfactorily completing (1) 24 semester credits in the major field and (2) the divisional requirements, each student, at the discretion of his major department, may be required to:

   a. Pass a comprehensive examination in his major field

   or

   b. Prepare a satisfactory paper on a subject approved by his supervisor, in the student's field of concentration.

D. Prescribed Curriculum Requirements

1. A student registered in a Prescribed curriculum must satisfy the General University Requirements and the General College Requirements described in previous pages.

2. *Inasmuch as all Prescribed curriculums are intended to furnish professional or semi-professional preparation, students selecting them are held for the successful completion of all the courses prescribed and generally in the sequence in which they are arranged in the curriculum.*

3. A student pursuing a Prescribed curriculum must meet the quality requirements established for that curriculum. (See descriptions of the curriculums on preceding pages.)

GENERAL LIBERAL ARTS CURRICULUM

FRESHMAN YEAR

	First Semester Credits	*Second Semester Credits*
R.O.T.C.	1½	1½
P. E. 1, 2 *(women)*	1	1
P. E. 31, 32 *(men)*	½	½
Hist. 1, 2, *Introduction to Contemporary Civilization*	3	3
*A Biological Science (*Biol. 1-2*) or a Physical Science (*Chem. 1-2; Chem. 3-4†; Geol. 1-2; Math.* (2), (3); *Math. 7-8; Ph. Sci. 1-2*; or *Phys. 1-2‡*)	3 or 4	3 or 4
Engl. 1-2, *Freshman English*	3	3
§Electives to meet semester requirements		
	16	16

SOPHOMORE YEAR

R.O.T.C.	1½	1½
P. E. 3, 4, *(women)*	1	1
Elect one year's work from each of the three following groups (see group requirements, page 96):		
Group I. Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2	3	3
Group II. *A Biological Science (*Biol. 1-2*) or a Physical Science (*Chem. 1-2; Chem. 3-4†; Geol. 1-2; Math.* (2), (3); *Math. 7-8; Ph. Sci. 1-2; Phys. 1-2*	3 or 4	3 or 4
Group III. Economics, Government, Psychology, Sociology	3	3
Electives to meet semester requirements		
	16	16

JUNIOR YEAR

P. E. 5, 6 *(women)*	1	1
Major courses and electives to meet semester requirements		
	16	16

SENIOR YEAR

Major courses and electives to meet semester requirements		
	16	16

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* Students electing a Biological Science during their freshman year must elect a Physical Science during their sophomore year, or *vice versa*.

† Chemistry 3-4 is required for pre-medical students and all who intend to take advanced work in chemistry.

‡ Students who expect to major in Physics should not register for Physics 1-2, but should elect Mathematics 21-22, and Physics 18, to be able to schedule Mathematics 23-24, and Physics 23-24 in the sophomore year.

§ See Special Language Requirement, page 95.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 95.

BUSINESS CURRICULUM

FRESHMAN YEAR

	First Semester Credits	Second Semester Credits
*See freshman requirements, page 95		
B. A. 1-2, *Elementary Accounting*	3	3
	16	16

SOPHOMORE YEAR

	First Semester Credits	Second Semester Credits
R.O.T.C.	1½	1½
P. E. 3, 4 (*women*)	1	1
Econ. 1-2, *Principles of Economics*	3	3
Elective from Group I	3	3
Elective from Group III	3	3
	16	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

Group III. — Six semester credits from Government; History; Psychology; Sociology

JUNIOR YEAR

	First Semester Credits	Second Semester Credits
P. E. 5, 6 (*women*)	1	1
B. A. 21-22, *Commercial Law*	3	3
B. A. 23, *Business Communications*	3	
Econ. 25, *Marketing*	3	
Econ. 51, *Labor Economics*	3	
Electives from Economics and Business Administration	3	3
Engl. (35), *Public Speaking*		3
Electives		
	16	16

SENIOR YEAR

	First Semester Credits	Second Semester Credits
B. A. 34, *Business Management*		3
Econ. 31, *Economics and Business Statistics*	3	
Econ. 53, *Money and Banking*	3	
Econ. 56, *Corporation Finance*		3
Electives		
	16	16

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* Students offering one or more units of Physical Science for admission are advised to elect Biol. 1-2. Students offering one or more units of Biological Science for admission are advised to elect Physical Science.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 82.

BUSINESS CURRICULUM
(Accounting Option)

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
P. E. 3, 4 (*women*)	1	1
B. A. 3-4, *Intermediate Accounting*	3	3
Econ. 1-2, *Principles of Economics*	3	3
Elective from Group I	3	3
	16	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

JUNIOR YEAR

P. E. 5, 6 (*women*)	1	1
B. A. 7-8, *Cost Accounting*	3	3
B. A. 21-22, *Commercial Law*	3	3
B. A. 23, *Business Communications*	3	
Econ. 25, *Marketing*	3	
Econ. 56, *Corporation Finance*		3
Engl. (35), *Public Speaking*		3
Elective from Group III	3	3
Electives		
	16	16

Group III. — Six semester credits from Government; History; Psychology; Sociology

SENIOR YEAR

B. A. 55, *Advanced Accounting*	3	
B. A. 56, *Federal Tax Accounting*		3
B. A. 57, *Auditing*	3	
B. A. 61, *Analysis of Financial Statements*	3	
B. A. 68, *Personnel Administration*		3
Econ. 31, *Economics and Business Statistics*	3	
Econ. 53, *Money and Banking*	3	
Electives		
	16	16

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 82.

HOTEL ADMINISTRATION CURRICULUM

Freshman Year	*First Semester Credits*	*Second Semester Credits*
See freshman requirements, page 95		
Arts 20, *Elementary Drafting*		2
Chem. 1-2, *General Chemistry*	4	4
H. Ad. 1, *Orientation*	½	
Psych. 1, *General Psychology*	3	
Electives		
	16	16

Sophomore Year*		
R.O.T.C.	1½	1½
B. A. 1-2, *Elementary Accounting*	3	3
Econ. 1-2, *Principles of Economics*	3	3
H. Ad. 42, *Lectures on Hotel Management*		½
H. Ad. 26, *Hotel Engineering Problems*		4
H. Ec. 15-16, *Food Preparation*	3	3
Electives		
	16	16

Junior Year*		
B. A. 9-10, *Hotel Accounting*	3	3
E. E. 31, *Circuits and Appliances*	4	
H. Ad. 5, *Hotel Operation*	3	
H. Ad. 44, *Lectures on Hotel Management*		½
H. Ec. 51-52, *Quantity Foods and Purchasing*	3	3
M. E. 40, *Heating and Ventilating*		3
Elective from Group I	3	3
	16	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English (not including Speech); Humanities 1-2; Music 37-38; Languages; Philosophy 1, 2

Senior Year		
B. A. 21-22, *Commercial Law*	3	3
H. Ad. 46, *Lectures on Hotel Management*		½
Psych. 32, *Industrial Psychology*		3
Electives from Group III	3	3
Electives		
	16	16

Group III. — Six semester credits from Government; History; Sociology.

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* In addition to the requirements listed above, each student is required to secure before graduation a minimum of 20 points of Hotel Practice credit.

Detailed Description of this Curriculum Appears on Page 82.

UNIVERSITY OF NEW HAMPSHIRE

MEDICAL TECHNOLOGY CURRICULUM

FRESHMAN YEAR	*First Semester Credits*	*Second Semester Credits*
See freshman reqquirements, page 95 (Include Biology 1-2 and Chemistry 3-4).		
Math. (2), (3), *Algebra, Trigonometry*	3	3
Electives		
	16	16

SOPHOMORE YEAR

P. E. 3, 4 (*women*)	1	1
Bact. 1, *General Bacteriology*	4	
Bact. 8, *Pathogenic Bacteriology*		4
Chem. 17, *Introductory Quantitative Analysis*	4	
Chem. (45), *Organic Chemistry*		5
Hist. 1, 2, *Introduction to Contemporary Civilization*	3	3
Elective from Group I	3	3
Elective		
	16	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

JUNIOR YEAR

P. E. 5, 6 (*women*)	1	1
Biochem. 56, *Physiological Chemistry*		5
Bact. 53, *Immunology and Serology*	4	
Zool. 17, *Human Anatomy*	4	
Zool. 20, *Human Physiology*		4
Elective from Group III	3	3
Elective		
	16	16

Group III. — Six semester credits from Government; History; Psychology; Sociology

SENIOR YEAR

*Biol. 61-62, *Clinical Laboratory Methods*	16	16

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* This course starts about June 20 at the Mary Hitchcock Memorial Hospital School of Medical Technology and includes lecture and laboratory work in bacteriology, blood bank and serology, clinical chemistry, hematology, laboratory management and ethics, mycology, parasitology, histology, and clinical microscopy. The credits are awarded in time for graduation in June of the following year after receipt of an official transcript of the grades obtained at the School of Medical Technology and certification by the director of this school and the supervisor of the curriculum that the work has been successfully completed.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 83.

NURSING CURRICULUM*

Freshman Year

	First Semester Credits	*Second Semester Credits*
See freshman requirements, page 95 (Include Biology 1-2.)		
Chem. 3-4, *General Chemistry*	4	4
	16	16

Sophomore Year

	First Semester Credits	*Second Semester Credits*
P. E. 3, 4, (*women*)	1	1
Zool. 17, *Human Anatomy*	4	
Zool. 20, *Human Physiology*		4
Elective from Group I	3	3
	16	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

Junior Year

	First Semester Credits	*Second Semester Credits*
P. E. 5, 6 (*women*)	1	1
Biochem. 1, *Organic and Biological Chemistry*	5	
Zool. 66, *Elements of Histology and Microtechnique*		4
Electives from Group III	3	3
Electives		
	16	16

Group III. — Six semester credits from Economics; Government; Psychology; Sociology

Training Period

Credit earned in training at an approved hospital will apply toward a Bachelor's degree. The University should be informed of the training school affiliation. A transcript of the hospital record must be submitted upon completion of the training program. An application for a degree must be filed. (See page 94.)

Detailed Description of this Curriculum Appears on Page 84.

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* This curriculum is intended to precede hospital training.

UNIVERSITY OF NEW HAMPSHIRE

OCCUPATIONAL THERAPY CURRICULUM

FRESHMAN YEAR

	First Semester Credits	*Second Semester Credits*
See freshman requirements, page 95. (Include Biology 1-2.)		
Arts 23, *Basic Design*	2	
Arts 24, *Drawing and Design*		2
Soc. 1-2, *Introductory Sociology: Principles and Problems*	3	3
	16	16

SOPHOMORE YEAR

	First Semester Credits	*Second Semester Credits*
P. E. 3, 4 (*women*)	1	1
O. T. 41-42, *Theory of Occupational Therapy*	2	2
Psych. 1, *General Psychology*	3	
Psych. (47), *Mental Hygiene*		3
Zool. 17, 20, *Human Anatomy and Human Physiology*	4	4
Elective from Group I	3	3
Elective from Group III	3	3
Elective		
	16	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

Group III. — Six semester credits from Economics; Government; History

JUNIOR YEAR

	First Semester Credits	*Second Semester Credits*
P. E. 5, 6 (*women*)	1	1
O. T. 1, 2, *Crafts*	2	3
O. T. (10), *Lettering and Printing*	2	
O. T. 44, *Theory of Occupational Therapy*		2
Psych. 37, *Developmental Psychology*	3	
Psych. 54, *Psychopathology*		3
Zool. 19, *Kinesiology*	3	
Zool. 64, *Neurology*		4
*Elective		
	16	16

SENIOR YEAR

	First Semester Credits	*Second Semester Credits*
O. T. (6), *Weaving*	3	
O. T. (5), *Jewelry and Metalwork*		3
O. T. 7-8, *Elementary Processes in Wood and Plastics*	2	2
O. T. 15-16, *Ceramics and Modeling*	2	2
O. T. 46, *Theory of Occupational Therapy*		3
*O. T. 49-50, *Clinical Subjects*	2	2
Elective		
	16	16

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* O.T. 49-50 is offered in alternate years for juniors and seniors; offered in 1958-1959.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 84.

PRE-MEDICAL CURRICULUM

	First Semester Credits	*Second Semester Credits*
FRESHMAN YEAR		
See freshman requirements, page 95. (Include Chemistry 3-4.)		
Math. 7-8, *Fundamental Mathematics* or Math. (2), (3), *Algebra, Trigonometry*	3	3
	16	16
SOPHOMORE YEAR		
R.O.T.C.	1½	1½
P. E. 3, 4 (*women*)	1	1
Biol. 1-2, *Man and the Living World*	3	3
Chem. (21), *Semimicro Qualitative Analysis*		4
*Language (French or German)	3	3
Phys. 1-2, *Introductory Physics*	4	4
‡Social Science	3	
†Elective		
	16	16
JUNIOR YEAR		
P. E. 5, 6 (*women*)	1	1
Chem. 51-52, *Organic Chemistry*	5	5
*Language	3	3
‡Social Science	3	3
Zool. 7-8, *General Zoology and Comparative Anatomy*	5	5
†Elective		
	16	16
SENIOR YEAR		
§Humanities Group	3	3
‡Social Science	3 or	3
†Elective		
	16	16

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* Either French or German. If the student passes an entrance reading test in either French or German, one year of the same language will fulfill the language requirement. To fulfill the requirement the student must complete either French 3-4; 5-6; German 3-4; or 5-6.

† No more than 24 semester hours of Biology (including Botany, Bacteriology, Entomology, and Zoology), Chemistry and Physics in addition to the required courses may be taken as elective.

‡ The student must complete 12 semester hours selected from courses in the following departments: Economics, Government, History (other than History 1, 2), Psychology, Sociology. Courses from at least three of the five departments must be presented.

§ The student must complete 6 semester hours from the following courses: Humanities 1-2; Music 37-38; Arts 31, 32; Philosophy; English 13, 14, 15, 16, (or English courses numbered 51-100).

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 86.

SECRETARIAL CURRICULUM

FRESHMAN YEAR	*First Semester Credits*	*Second Semester Credits*
See freshman requirements, page 95.		
Electives		
	16	16

SOPHOMORE YEAR		
P. E. 3, 4 (*women*)	1	1
B. A. 24, *Introduction to Business*		3
Econ. 3, *Economic and Commercial Development of U. S.*	3	
Secl. 1-2, *Shorthand*	3	3
Secl. 7-8, *Typewriting*	2	2
Secl. 23-24, *Business Writing*	3	3
*Electives		
	16	16

JUNIOR YEAR		
P. E. 5, 6 (*women*)	1	1
B. A. 1-2, *Elementary Accounting*	3	3
Elective from Group I	3	3
†Secl. 3-4, *Advanced Shorthand*	3	3
†Secl. 9-10, *Advanced Typewriting*	2	2
Electives		
	16	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

SENIOR YEAR		
B. A. 21-22, *Commercial Law*	3	3
Secl. 11, *Filing*	2	
Secl. (13), *Office Machines*		2
Secl. 17-18, *Office Procedure and Practice*	3	3
Elective from Group III	3	3
Electives		
	16	16

Group III. — Six semester credits from Government; History; Psychology; Sociology

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* Students preparing to teach secretarial subjects must elect in addition a sufficient number of courses in Education to meet state requirements. See page 90 for a description of the Commercial Teacher Preparation program as an option in the Secretarial curriculum.

† A grade of C or better in Secl. 8 will be required of students electing Secl. 9-10: and a grade of C or better in Secl. 2 will be required of students electing Secl. 3-4.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 86.

SOCIAL SERVICE CURRICULUM

Freshman Year

	First Semester Credits	*Second Semester Credits*
See freshman requirements, page 95. (Include Biology 1-2.)		
Soc. 1-2, *Introductory Sociology: Principles and Problems*	3	3
Electives		
	16	16

Sophomore Year

R.O.T.C.	1½	1½
P. E. 3, 4 (*women*)	1	1
Bact. 5, *Public Health and Sanitation*	3	
Psych. 1, *General Psychology*	3	
Psych. (47), *Mental Hygiene*		3
Soc. 43, *Urban Sociology*	3	
Soc. 44, *Social Psychology*		3
Electives from Group I	3	3
Electives		
	16	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

Junior Year

P. E. 5, 6 (*women*)	1	1
Soc. 71, *Criminology*	3	
Soc. 72, *The Family*		3
Soc. 73, 74, *Introduction to Social Welfare*	3	3
Elective from Group III	3	3
Electives		
	16	16

Group III. — Six semester credits from Economics; Government; History

Senior Year

Soc. 75, 76, *Methods of Social Research*	3	3
Soc. 97, *Social Welfare Field Experience*	6	
One course must be elected from: Bot. 6, or 42; Ent. 2; Zool. 7, 17, 36, or 61	3, 4, 5	or 3
Electives		
	16	16

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 87.

ART EDUCATION CURRICULUM

FRESHMAN YEAR

	First Semester Credits	*Second Semester Credits*
See freshman requirements, page 95.		
Arts 23, *Basic Design*	2	
Arts 24, *Drawing and Design*		2
Electives		
	16	16

SOPHOMORE YEAR

R.O.T.C.	1½	1½
P. E. 3. 4 (*women*)	1	1
Arts 15, 16, *Ceramics*	2	2
Arts 25, 26, *Advanced Drawing and Painting*	3	3
Educ. 41, 42, *Educational Psychology*	3	3
Elective from Group I	3	3
Elective from Group III	3	3
Elective		
	16	16

Group I. — A year's work (two sequential semesters) from English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

Group III. — Six semester credits from Economics; Government; History; Psychology; Sociology

JUNIOR YEAR

P. E. 5, 6 (*women*)	1	1
*Arts 27, 28, *Graphic Arts; Commercial Design* or *Arts 29, 30, *Advanced Painting and Composition*	3	3
Arts 31, 32, *Introduction to The Arts*	3	3
Arts (35), Stagecraft		2
Educ. (52), *Principles of American Secondary Education*	3	
Educ. 58, *Planning for Teaching in High School*		4
H. Ec. 31, *Home Decoration*	3	
Elective		
	18	16

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* Offered in alternate years. Student will register for whichever sequence is offered in his junior year.

SENIOR YEAR

Arts 3, *Crafts*	2	
†Arts 27, *Graphic Arts* or †Arts 29, *Advanced Painting and Composition*	3	
Art-Ed. 91, *Problems of Teaching Art in Elementary Schools*	3	
Art-Ed. (92), *Problems of Teaching Art in Secondary Schools*	3	
Ed.-Art. 94, *Supervised Teaching*		14
H. Ec. 65, *History of Costume*	3	
Elective		
	16	14

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† If Arts 27 is completed in the junior year, Arts 29 should be taken in the senior year or *vice versa.*

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 89.

MUSIC EDUCATION CURRICULUM

FRESHMAN YEAR

See freshman requirements, page 95.

	First Semester Credits	*Second Semester Credits*
*Applied Music	2	2
†Mus. 9-10, *Sightsinging, Ear Training, Dictation I*	0	0
‡Recitals		
Electives		
	15	15

SOPHOMORE YEAR

	First Semester Credits	*Second Semester Credits*
R.O.T.C.	1½	1½
P. E. 3, 4 (*women*)	1	1
*Applied Music	2	2
Educ. 41, 42, *Educational Psychology*	3	3
§Mus. 11-12, *Harmony I*	2	2
Mus. 13-14, *Sightsinging, Ear Training, Dictation II*	1	1
Mus. 37-38, *Introduction to Music Literature*	3	3
Mus. 41-42, *Principles of Conducting*	1	1
Music Organizations	½	½
Elective from Group III	3	3
‡Recitals		
	17	17

Group III. — Six semester credits from Economics; Government; History; Psychology; Sociology

JUNIOR YEAR

	First Semester Credits	*Second Semester Credits*
P. E. 5, 6 (*women*)	1	1
*Applied Music	3	3
Educ. 52, *Principles of American Secondary Education*		3
Educ. (58), *Planning for Teaching in High School*	4	
Language (French, German or Italian)	3	3
Mu.-Ed. 90, *Problems in the Teaching of Elementary School Music*		3
Mu.-Ed. 97, *Techniques and Methods in Brass and Percussion Instruments*	2	
Mus. 15-16, *Harmony II*	2	2
Mus. 97-98, *Orchestration and Chorestration*	2	2
Music Organizations	½	½
‡Recitals		
	17½	17½

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* For explanation of footnotes, see page 111.

SENIOR YEAR	*First Semester Credits*	*Second Semester Credits*
*Applied Music	2	
Mu.-Ed. 93, *Problems in the Teaching of Secondary School Music*	3	
Mu.-Ed. 95, *Techniques and Methods in String Instruments*	2	
Mu.-Ed. (96), *Techniques and Methods in Woodwind Instruments*	2	
Music Organizations	1	
Ed.-Mu. (93), *Supervised Teaching of Elementary School Music*		7
Ed.-Mu. 94, *Supervised Teaching of Secondary School Music*		7
Electives		
	15	14

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* A minimum of 16 semester credits in Applied Music must be offered by students in this curriculum.

† Qualified students are exempted from this requirement upon proper notification to the College Dean's Office and the University Recorder.

‡ Recitals — Students enrolled in this curriculum must accumulate a minimum of 24 points in the sophomore, junior, and senior years. Attendance at each concert or recital constitutes one point.

§ Although Mus. 9-10 is normally a prerequisite to 11-12, it may be taken concurrently with 11-12 by permission of instructors.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 90.

PHYSICAL EDUCATION
TEACHER PREPARATION CURRICULUM FOR MEN

FRESHMAN YEAR	*First Semester Credits*	*Second Semester Credits*
See freshman requirements, page 95. (Include Biology 1-2.)		
Basic course in second teaching major	3	3
	16	16

SOPHOMORE YEAR		
R.O.T.C.	1½	1½
Educ. 41, 42, *Educational Psychology*	3	3
P. E. 23, *Principles of Physical Education*	3	
Second teaching major; *Second year*	3	3
Zool. 17, *Human Anatomy*	4	
Zool. 18, *Human Physiology*		3
Group III	3	3
Elective		
	17½	16

Group III. — Six semester credits from Economics; Government; Psychology; Sociology

JUNIOR YEAR		
Educ. (52), *Principles of American Secondary Education*	3	
Educ. 58, *Planning for Teaching in High School*		4
P. E. (61), *Problems of Teaching in Physical Education*		3
*Problems of coaching, *P. E. 47, (48)*	4	
*Problems of coaching, *P. E. (45), 46*		4
Second teaching major	3	3
Group I	3	3
Elective, *first teaching minor*		
	16	17

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

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* For explanation of footnotes, see page 113.

SENIOR YEAR	*First Semester Credits*	*Second Semester Credits*
Ed.-P. E. 93, *Directed Teaching in Physical Education*	3	
P. E. 65, *Administration of Physical Education in Secondary Schools*	3	
*Problems of coaching, *P. E. 47, (48)*	4	
Problems of teaching, *Second teaching major, i.e., Engl.-Ed. 91, etc.*	3	
Second teaching major	3	
Supervised teaching in major or majors, *i.e., Ed.-Engl. 94 etc.*		14
Elective		
	16	14

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* Four problems of coaching courses are required.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 91.

PHYSICAL EDUCATION
TEACHER PREPARATION CURRICULUM FOR WOMEN*

FRESHMAN YEAR

	First Semester Credits	*Second Semester Credits*
See freshman requirements, page 95. (Include Biology 1-2.)		
Electives		
	16	16

SOPHOMORE YEAR

	First Semester Credits	*Second Semester Credits*
P. E. 3, 4	1	1
P. E. 13, 14	1	1
P. E. 23, *Principles of Physical Education*	3	
P. E. (36), *Recreation Leadership*	3	
Educ. 41, 42, *Educational Psychology*	3	3
Zool. 17, *Human Anatomy*	4	
Zool. 18, *Human Physiology*		3
Elective from Group I	3	3
Elective		
	18	16

Group I. — A year's work (two sequential semesters) from Arts 31, 32; English 13, 14; or 15, 16; Humanities 1-2; Languages; Music 37-38; Philosophy 1, 2

JUNIOR YEAR

Physical Education Option†

	First Semester Credits	*Second Semester Credits*
P. E. 5, 6	1	1
Educ. 52, *Principles of American Secondary Education*		3
P. E. 53, 54, *The Theory of Teaching Dance*	2	2
P. E. 56, *Health Education*		3
P. E. 63, 64, *The Theory of Teaching Team Sports*	2	2
Zool. 19, *Kinesiology*	3	
Elective from Group III	3	3
Electives		
	16	16

Group III. — Six semester credits from Economics; Government; History; Psychology; Sociology

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* Students desiring to go into Physical Therapy may, by petitioning, make certain substitutions in this program.

† Students desiring to teach in areas in addition to Physical Education must plan to take Educ. 58. They must also elect 18 semester hours in a second teaching field.

JUNIOR YEAR

Recreation Education Option*

	First Semester Credits	*Second Semester Credits*
P. E. 5, 6	1	1
Arts 35, *Stagecraft*	2	
Arts 4, *Crafts*		2
For. 38, *Woodcraft*		3
P. E. 24, *Organized Camping*		3
P. E. 53, 54, *The Theory of Teaching Dance*	2	2
P. E. 73, 74, *The Theory of Teaching Individual Sports for Women*	2	2
Soc. 1-2, *Introductory Sociology: Principles and Problems*	3	3
Electives		
	16	16

SENIOR YEAR

Physical Education Option†

	First Semester Credits	*Second Semester Credits*
Ed.-P. E. 92, *Directed Teaching of Physical Education for Women*		6
P. E. 55, *Remedial Gymnastics*	3	
P. E. (66), *Administration of Physical Education*	3	
P. E. 73, 74, *The Theory of Teaching Individual Sports for Women*	2	2
P. E.-Ed. 91, *Problems in the Teaching of Physical Education for Women*	3	
Electives other than Physical Education	3	3
	16	16

Recreation Education Option*

	First Semester Credits	*Second Semester Credits*
Engl. 48, *Dramatics Workshop*		3
‡Music 37, *Introductiton to Music Literature*	3	
P. E. (66), *Administration of Physical Education*	3	
P. E. 96, *Recreation Field Work*		6
P. E.-Ed. 91, *Problems in the Teaching of Physical Education for Women*	3	
Soc. 44, *Social Psychology*		3
Elective from Group I	3	3
Elective from Group III	3	3
Elective		
	16	16

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* In addition to the requirements listed above, each student is required to secure before graduation a minimum of 8 points of community recreation or camping credit.

† Students desiring to teach in areas in addition to Physical Education must plan to take Educ. 58. They must also elect 18 semester hours in a second teaching field.

‡ If Music has already been taken in the sophomore year, 3 additional hours in Group I must be taken in the senior year.

DETAILED DESCRIPTION OF THIS CURRICULUM APPEARS ON PAGE 91.

The College of Technology

Edward T. Donovan, *Acting Dean*

Departments

Chemical Engineering
Chemistry
Civil Engineering
Electrical Engineering
Mathematics
Mechanical Engineering
Physics

GENERAL INFORMATION

All students in the College of Technology receive a thorough training in the fundamentals of mathematics and the physical sciences. They also receive additional education and training in the field of their specialty, preparing them for successful careers in industry, or for further study in graduate schools. All curriculums include courses of general education designed to foster a better understanding by the scientists and engineers of their relationship and the relationship of their work to their environment.

REQUIREMENTS FOR DEGREES

The College of Technology offers the following baccalaureate degrees: Bachelor of Science in Chemical Engineering, Bachelor of Science of Chemistry, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Mathematics, Bachelor of Science in Mechanical Engineering, and Bachelor of Science in Physics. Each candidate for a degree must satisfy all general University requirements for graduation, complete at least 144 semester credits, including the courses required in one of the four-year curriculums described below, and achieve a grade-point average of at least 1.8. Each candidate must include in his course of study a minimum of 24 credits in what is variously described as general education, social-humanistic or non-technical courses. Such courses must have the approval of the department in which the candidate is majoring. For information concerning advanced degrees, see the Graduate School catalogue.

CURRICULUMS

Note — All curriculums in the College of Technology have been revised recently. Therefore, two curriculums are shown for each department: one for students entering as freshmen after June, 1958, and the other for students who will complete their programs of study before September, 1961.

The following four-year curriculums are offered:

Chemical Engineering Curriculum

Chemical Engineering is that branch of engineering which involves the application of chemistry, physics, mathematics, and fundamental engineering principles to the design, construction, operation, control, and improvement of equipment for carrying out chemical processes on an industrial scale at the lowest possible cost. The Chemical Engineering curriculum, therefore, is designed to give the student basic training in the physical sciences, engineering principles, and economics, and thus enable him to become a member of this profession. Although chemical engineering is a distinct profession, chemical engineers are considered to be members of the chemical profession as well as of the engineering profession and a considerable portion of the Chemical Engineering curriculum is devoted to the science of chemistry. However, emphasis is placed not upon the laboratory phases of chemistry, but upon the large-scale manufacture of chemical products.

Chemistry Curriculum

This curriculum is intended to prepare the student for the career of a professional chemist in industry and to give a good foundation for graduate study leading to original and independent research.

Instruction is given by lectures, recitations, and carefully supervised laboratory work. The laboratory study is largely individual and the course work of each student is planned to furnish a broad knowledge of chemical science. The student may elect either German or French to enable him to read with ease the chemical literature, and he receives a grounding in mathematics and physics necessary for the later courses in chemistry. In the senior year, an independent research project, which permits the student to use the reference library and chemical periodicals throughout the course of the laboratory investigation, is undertaken.

Civil Engineering Curriculum

This curriculum is designed to give the student theoretical and practical instruction in the principles on which the practice of civil engineering is based, and to give him the opportunity of applying these principles in the classroom, design room, laboratory, and field.

Civil engineering, the oldest of the engineering professions, covers a broad field of activity, including structural, transportation, hydraulic, and sanitary engineering, and surveying by plane, topographic, geodetic, and photogrammetric methods. This curriculum places about equal emphasis on each of the main branches.

Electrical Engineering Curriculum

This curriculum provides instruction intended to prepare the student for graduate study or to begin his career in professional electrical engineering. In the first two years the student concentrates on mathematics and basic sciences which provide essential preparation for the engineering science, analysis, and design courses of the last two years. Since the emphasis is on fundamentals, the curriculum does not provide for extensive specialized training in any particular sub-branch of electrical engineering. In the junior and senior years, however, the student is provided an opportunity to elect some courses in particular areas of interest.

Mathematics Curriculum

The Technology curriculum in Mathematics is intended to provide an education in the fundamentals of pure and applied mathematics. It also affords a training in the sciences closely allied to mathematics. Available for the use of the student is the reading room in DeMeritt Hall, containing mathematical periodicals and books. This curriculum offers a preparation which serves equally well for graduate study, research in industry, research in the various government agencies. In the broader sense, it aims to furnish a training useful in any scientific study.

Mechanical Engineering Curriculum

The Mechanical Engineering curriculum is intended to prepare young men and women either for graduate study or to enter the field of professional mechanical engineering. The curriculum provides a firm foundation in the basic physical sciences and the engineering sciences, augmented by a coordinated sequence of social-humanistic courses. Training is provided in the organization and utilization of principles, personnel, and physical resources for the solution of mechanical engineering problems.

Physics Curriculum

The Technology curriculum in Physics is intended to offer basic training in fundamentals, supplemented by laboratory work, in the various branches of physics. Opportunity is given in the senior year for experimental investigation in some of the fields of physics under guidance of staff members. Such a curriculum prepares one equally well for basic research in industry, the various government research organizations, or for continued academic study toward the more advanced degrees.

Agricultural Engineering

Note — Agricultural Engineering is offered by the College of Agriculture (see page 37). Basic science and some engineering courses in the curriculum of Agricultural Engineering are given by the College of Technology.

ALUMNI REPRESENTATION

An advisory committee of alumni of the College of Technology, composed of men in contact with industry and practical professional affairs, serves to keep the Faculty in touch with developments in the several fields which attract our graduates. Members of this committee also serve as consultants when important changes in curriculum, faculty personnel, and policies of administration are considered. The members are:

John T. Croghan, B.S. in M.E. '08, 574 Chestnut Street, Waban 68, Mass.

Donald B. Keyes, Ph.D., M.A., B.S. in Chem., '13, Arthur D. Little, Inc., 2041 Graybar Building, 420 Lexington Ave., New York, N. Y.

Donald W. Loiselle, M.S., B.S. in C.E., '40, Bridgeport Hydraulic Company, Bridgeport, Conn.

Austin S. Norcross, M.S., B.S. in E.E., '25, Norcross Corp., 247 Newtonville Ave., Newton 58, Mass.

Lester A. Pratt, Ph.D., M.S., B.S. in Chem., '09, 7 Everett Avenue, Winchester, Mass.

CHEMICAL, CIVIL, ELECTRICAL, AND MECHANICAL ENGINEERING

(For students who enter as freshmen after June, 1958)

FRESHMAN YEAR	*First Semester Credits*	*Second Semester Credits*
P. E., 31, 32	½	½
R.O.T.C.	1½	1½
Chem. 3-4, *General Chemistry*	4	4
Engl. 1-2, *Freshman English*	3	3
Math. 21-22, *Technology Mathematics I and II*	5	5
M. E. 13-14, *Engineering Drawing*	1	1
Phys. 18, *General Physics I*		4
Approved Social-Humanistic Elective	3	
	18	19

Note — The program for the freshman year in the curriculums in Chemical, Civil, Electrical, and Mechanical Engineering is the same.

The programs for the sophomore, junior, and senior years in the Chemical Engineering curriculum are given on page 121; for Civil Engineering, on page 125; for Electrical Engineering, on page 127; for Mechanical Engineering, on page 131.

CHEMICAL ENGINEERING

(For students who will complete requirements for degrees before September, 1961)

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
Chem. 21, *Semimicro Qualitative Analysis*	4	
Chem. 22, *Quantitative Analysis*		5
Econ. 1-2, *Principles of Economics*	3	3
Math. 17-18, *Calculus*	3	3
Phys. 21-22, *General Physics*	6	6
	17½	18½

JUNIOR YEAR		
Ch. E. 41, *Process Engineering Principles*	5	
Chem. 47-48, *Organic Chemistry*	5	5
Chem. 83-84, *Physical Chemistry*	5	5
Ch. E. 71-72, *Unit Process*	2	2
Ch. E. 74, *Unit Operations*		3
E. E. 33, *Fundamentals of Electricity*		4
Math. 19, Engl. 35, or Approved Elective	3	
	20	19

SENIOR YEAR		
Ch. E. 75, *Unit Operations*	3	
Ch. E. 76, *Chemical Engineering Economics*		3
Ch. E. 77, *Unit Operations Laboratory*	3	
Ch. E. 78, *Chemical Plant Design*		3
Ch. E. 79, *Chemical Engineering Thermodynamics*	3	
Ch. E. 80, *Chemical Engineering Project*, or Approved Elective		5
Chem. 87-88, *Chemical Literature and Seminar*	1	1
M. E. 7-8, *Mechanics*	4	4
Ch. E. 61, *Metallography*	3	
	17	16

COLLEGE OF TECHNOLOGY

CHEMICAL ENGINEERING

(For students who enter as freshmen after June, 1958)

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
Chem. 21, *Semimicro Qualitative Analysis*	4	
Chem. 22, *Quantitative Analysis*		5
Math. 23, *Technology Mathematics III*	5	
Math. 24, *Differential Equations*		3
Phys. 23-24, *General Physics II and III*	4	4
M. E. 25, *Statics*	2	
M. E. 26, *Dynamics*		3
Social-Humanistic*	3	3
	19½	19½
JUNIOR YEAR		
Chem. 47-48, *Organic Chemistry*	5	5
Chem. 83-84, *Physical Chemistry*	5	5
Ch. E. 51-52, *Chemical Engineering Principles I and II*	4	4
Ch. E. 54, *Chemical Engineering Principles III*		3
Social-Humanistic*	3	
	17	17
SENIOR YEAR		
Ch. E. 63, *Chemical Engineering Principles IV*	3	
Ch. E. 65, *Chemical Engineering Laboratory*	2	
Ch. E. 66 *Chemical Engineering Economics and Plant Design*		4
Ch. E. 67, *Chemical Engineering Thermodynamics*	3	
Ch. E. 68, *Metallography*		3
Ch. E. 69, *Chemical Engineering Project*		3
E. E. 37, *Fundamentals of Electrical Engineering*	4	
Social-Humanistic*	6	3
Tech. Elective†		4
	18	17

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* These courses must be selected from the following: English literature, government, history, humanities, languages, philosophy, psychology, sociology.

† Technical electives must be approved by the Department Chairman.

See page 119 for freshman requirements.

TECHNOLOGY CURRICULUM IN CHEMISTRY

(For students who will complete requirements for degrees before September, 1961)

SOPHOMORE YEAR (1958-1959 only)	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
Chem. 47-48, *Organic Chemistry*	5	5
Math. 17, 18, *Calculus*	3	3
Phys. 21-22, *General Physics*	6	6
Ger. 1-2, *Elementary German*	3	3
	18½	18½

JUNIOR YEAR (1958-1959 only)		
Chem. 31, *Technical Quantitative Analysis*	5	
Chem. 47-48, *Organic Chemistry*	5	5
Chem. 62, *Instrumental Analysis*		5
Chem. 83-84, *Physical Chemistry*	5	5
Approved Elective	3	3
	18	18

SENIOR YEAR		
Chem. 55-56, *Organic Chemistry* or Elective	3	3
Chem. 85-86, *Inorganic and Physical Chemistry* or Elective	3	3
Chem. 87, 88, *Chemical Literature and Seminar*	1	1
Chem. 89-90, *Thesis*, or Approved Elective	6	6
Approved Electives	6	6
	19	19

TECHNOLOGY CURRICULUM IN CHEMISTRY

(For students who enter as freshmen after June, 1958)

Freshman Year	*First Semester Credits*	*Second Semester Credits*
P. E. 31, 32	½	½
R.O.T.C.	1½	1½
Chem. 5-6, *General Chemistry and Qualitative Analysis*	6	6
Engl. 1-2, *Freshman English*	3	3
M. E. 13, *Engineering Drawing* or Elective	1	
Math. 21-22, *Technology Mathematics I and II*	5	5
Phys. 18, *General Physics I*		4
	17	20

Sophomore Year		
R.O.T.C.	1½	1½
Chem. 47-48, *Organic Chemistry*	5	5
Math. 23, *Technology Mathematics III*	5	
Math. 24, *Differential Equations* or Electives		3
Phys. 23-24, *General Physics II and III*	4	4
Electives	3	3
	18½	16½

Junior Year		
Chem. 31-62, *Analytical Chemistry*	5	5
Chem. 83-84, *Physical Chemistry*	5	5
Chem. (55), *Organic Chemistry*		3
Ger. 1-2, *Elementary German*	3	3
Elective	6	3
	19	19

Senior Year		
Chem. (56), *Organic Chemistry*	3	
Chem. 85, *Inorganic Chemistry*	3	
Chem. 86, *Physical Chemistry*		3
Chem. 87-88, *Chemical Literature and Seminar*	1	1
Chem. 89-90, *Thesis*	6	6
Elective	5	6
	18	16

CIVIL ENGINEERING

(For students who will complete requirements for degrees before September, 1961)

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
C. E. 3-4, *Surveying*	6	3
C. E. 6, *Route Surveying*		3
Math. 17-18, *Calculus II and III*	3	3
Phys. 21-22, *General Physics*	6	6
	16½	16½

JUNIOR YEAR		
C. E. 15, *Engineering Materials*	3	
C. E. 22, *Fluid Mechanics*		4
C. E. 27, *Theory of Determinate Structures*	4	
C. E. 28, *Theory of Indeterminate Structures*		3
C. E. 41, 42, *Student Chapter A.S.C.E.*	½	½
E. E. (33), *Fundamentals of Electricity*		4
Geol. 7, *General Geology*	2	
M. E. 9-10, *Mechanics*	3	4
M. E. 21, *Heat Power Engineering*	3	
Econ. 1-2, *Principles of Economics*	3	3
	18½	18½

SENIOR YEAR		
C. E. 33-34, *Hydraulic and Sanitary Engineering*	4	5
C. E. 35, *Steel Design*	3	
C. E. 37, *Reinforced Concrete Design*	3	
C. E. 38, *Structural Engineering*		3
C. E. 39, *Highway Engineering and Transportation*	4	
C. E. 40, *Soil Mechanics and Foundations*		3
C. E. 43, 44, *Student Chapter, A.S.C.E.*	½	½
Engl. (23), *Writing of Technical Reports*		2
Approved Elective	6	6
	20½	19½

CIVIL ENGINEERING

(For students who enter as freshmen after June, 1958)

SOPHOMORE YEAR

	First Semester Credits	*Second Semester Credits*
R.O.T.C.	1½	1½
C. E. 1, *Surveying*	3	
C. E. 2, *Surveying*		3
Math. 23, *Technology Mathematics III*	5	
Math. 24, *Differential Equations*		3
Phys. 23-24, *General Physics II and III*	4	4
Econ. 1, *Principles of Economics*	3	
M. E. 25, *Mechanics, Statics*	2	
M. E. 26, *Mechanics, Dynamics*		3
Approved Social-Humanistic Elective		3
	18½	17½

JUNIOR YEAR

C. E. 5, *Surveying*	3	
C. E. 6, *Route Surveying*		3
C. E. 15, *Engineering Materials*	3	
C. E. 22, *Fluid Mechanics*		4
C. E. 25, *Theory of Determinate Structures*	4	
C. E. 26, *Steel Design*		3
C. E. 41, 42, *Student Chapter A.S.C.E.*	½	½
Geol. 7, *General Geology*	2	
M. E. 35, *Strength of Materials*	3	
M. E. (33), *Thermodynamics*		3
Engl. (23), *Writing of Technical Reports*		2
Approved Social-Humanistic Elective	3	3
	18½	18½

SENIOR YEAR

C. E. 29, *Theory of Indeterminate Structures*	3	
C. E. 33-34, *Hydraulic and Sanitary Engineering*	4	5
C. E. 37, *Reinforced Concrete Design*	3	
C. E. 38, *Structural Engineering*		3
C. E. 39, *Highway Engineering and Transportation*	4	
C. E. 40, *Soil Mechanics and Foundations*		3
C. E. 43, 44, *Student Chapter A.S.C.E.*	½	½
Approved Social-Humanistic Elective	3	3
Approved Elective		3
	17½	17½

Total Semester Credits 145

See page 119 for freshman requirements.

ELECTRICAL ENGINEERING

(For students who will complete requirements for degrees before September, 1961)

Sophomore Year	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
Econ. 1-2, *Economics*	3	3
E. E. 1-2, *Electrical Engineering*	3	4
Math. 17-18, *Calculus*	3	3
M. E. (4), *Kinematics*	3	
Phys. 21-22, *General Physics*	6	6
	19½	17½
Junior Year		
E. E. 3-4, *Applied Electromagnetics*	3	3
E. E. 5, *Circuit Theory*	3	
E. E. 6, *Electronics*		4
E. E. 15, 16, *Student Branch A.I.E.E.-I.R.E.*	0	0
E. E. 23-24, *Electrical Laboratory*	2	2
Math. 19, *Differential Equations*	3	
M. E. 9-10, *Mechanics*	3	3
M. E. 23-24, *Thermodynamics*	3	3
M. E. 27, 28, *Mechanical Laboratory*	1	1
*Approved Elective		3
	18	19
Senior Year		
C. E. 23, *Fluid Mechanics*	3	
E. E. 7, *Electronics*	4	
E. E. 17, 18 *Student Branch A.I.E.E.-I.R.E.*	0	0
E. E. 25, *Electrical Laboratory*	2	
E. E. 45, 46 *Electrical Networks, Fields*	3	3
Eng. (23), *Writing of Technical Reports*		2
M. E. 65, *Engineering Economy*	3	
M. E. 66, *Industrial Management*		3
Approved Non-Technical Electives	3	3
*Approved Electives		7
	18	18

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* Recommended electives are as follows: E.E. 58, Electronic Systems Analysis and Design; E.E. 60, Advanced Circuit Theory; E.E. (62), Illumination; E.E. 70, (70), Electrical Engineering Projects Laboratory; E.E. 78, Industrial Electronics; E.E. (80), Engineering Analysis; Engl. 35, (35), Public Speaking; Math. 20, (20), Applied Mathematics. Other electives may be selected with the consent of the adviser.

ELECTRICAL ENGINEERING

(For students who enter as freshmen after June, 1958)

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
E. E. 1-2, *Electrical Engineering*	3	4
Math. 23, *Technology Mathematics III*	5	
Math. 24, *Differential Equations*		3
M. E. 25-26, *Statics, Dynamics*	2	3
Physics 23-24, *General Physics II and III*	4	4
*Approved Non-Technical Elective	3	3
	18½	18½

JUNIOR YEAR		
E. E. 3-4, *Applied Electromagnetics*	3	3
E. E. 5, *Electric Circuits*	3	
E. E. 9-10, *Electronics*	3	4
E. E. 15-16, *Student Branch A.I.E.E.-I.R.E.*	0	0
E. E. 23, 24, *Electrical Laboratory*	2	2
M. E. (35), *Strength of Materials*		3
M. E. 33, 36, *Thermodynamics, Fluid Mechanics*	3	3
M. E. 37, *Mechanical Laboratory*	1	
*Approved Non-Technical Elective		3
†Approved Elective	3	
	18	18

SENIOR YEAR		
English (23), *Technical Report Writing*		2
E. E. 17, 18, *Student Branch A.I.E.E.-I.R.E.*	0	0
E. E. 25, 26, *Electrical Laboratory*	2	2
E. E. 45, 46, *Electrical Networks, Fields*	3	3
M. E. (34), *Thermodynamics*	3	
M. E. 65, *Engineering Economy*	3	
*Approved Non-Technical Elective	3	3
†Approved Elective	4	7
	18	17

See page 119 for freshman requirements.

* For graduation each student is required to have passed a minimum of 18 semester hours of courses selected from the following fields: arts, biology, botany, economics, English literature, government, history, humanities, languages, music, philosophy, psychology, sociology, and zoology. Non-technical courses will not be selected at random, but each student will consult with his adviser to select an integrated sequence of courses which provide an opportunity to concentrate in one or more of the above areas.

† Recommended electives include the following courses: E.E. 58, Electronics systems; E.E. 60, Advanced Circuit Analysis; E.E. 62, Illumination; E.E. 70, Advanced Laboratory Project; E.E. 78, Industrial Electronics; E.E. 80, Engineering Analysis; E.E. 82, Control Systems; Math. 51-52, Methods of Advanced Calculus; M.E. 21-22, Manufacturing Processes and Design; M.E. 39, Engineering Materials; M.E. 43-44, Machine Design and Analysis; M.E. 66, Industrial Management; and Phys. 37, Modern Physics. Other electives, either technical or non-technical, may be selected with the consent of the adviser.

TECHNOLOGY CURRICULUM IN MATHEMATICS

(For students who will complete requirements for degrees before September, 1961)

SOPHOMORE YEAR	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
Math. 17-18, *Calculus II and III*	3	3
Math. 43-44, *Mathematical Statistics*	3	3
Phys. 21-22, *General Physics*	6	6
Ger. 1-2, *Elementary German*	3	3
Approved Elective	2 or 3	2 or 3
	18½ or 19½	18½ or 19½

JUNIOR YEAR

Math. 19-20, *Differential Equations, Applied Mathematics*	3	3
Math. 47-48, *Introduction to Analysis*	3	3
Math. 61-62, *Higher Algebra*	3	3
Econ. 1-2, *Principles of Economics*, or Psych. 1-2, *General Psychology*	3	3
Ger. 3b-4b, *Intermediate German*	3	3
Approved Elective	3	3
	18	18

SENIOR YEAR

Math. 65-66, *Advanced Calculus*	3	3
Math. 85-86, *Theory of Functions*	3	3
Phys. 85-86, *Physical Mechanics*	3	3
French 1-2, *Elementary French*	3	3
Approved Electives	6	6
	18	18

TECHNOLOGY CURRICULUM IN MATHEMATICS

(For students who enter as freshmen after June, 1958)

FRESHMAN YEAR	*First Semester Credits*	*Second Semester Credits*
P. E. 31, 32	½	½
R.O.T.C.	1½	1½
Engl. 1-2, *Freshman English*	3	3
Chem. 3-4, *General Chemistry*	4	4
Math. 21-22, *Technology Mathematics I and II*	5	5
Phys. 18, *General Physics I*		4
Approved Non-Technical Elective	3	
	17	18

SOPHOMORE YEAR

R.O.T.C.	1½	1½
Math. 23, *Technology Mathematics III*	5	
Math. 24, *Differential Equations*		3
Math. 43-44, *Mathematical Statistics*	3	3
Phys. 23-24, *General Physics II and III*	4	4
Ger. 1-2, *Elementary German*	3	3
Approved Non-Technical Elective	3	3
	19½	17½

JUNIOR YEAR

Math. 51-52, *Methods of Advanced Calculus I and II*	3	3
Math. 61-62, *Higher Algebra I and II*	3	3
Math. 67-68, *Analysis I and II*	4	4
Ger. 3-4, *Intermediate German*	3	3
Approved Technical Elective	3	3
Approved Non-Technical Elective	3	3
	19	19

SENIOR YEAR

Math. 83, *Introduction to Differential Geometry*	3	
Math. 84, *Introduction to Topology*		3
Math. 87-88, *Analysis III and IV*	4	4
Math. 93, *Higher Algebra III*	3	
Math. 96, *Introduction to the Theory of Differential Equations*		3
Fr. 1-2, *Elementary French*	3	3
Approved Technical Elective	3	3
Approved Non-Technical Elective	3	
	19	16

MECHANICAL ENGINEERING

(For students who will complete requirements for degrees before September, 1961)

Sophomore Year	*First Semester Credits*	*Second Semester Credits*
R.O.T.C.	1½	1½
Econ. 1-2, *Economics*	3	3
Math. 17-18, *Calculus*	3	3
M. E. 3, *Machine Drawing*	2	
M. E. 4, *Kinematics*		3
M. E. 11-12, *Manufacturing Processes*	2	2
Phys. 21-22, *General Physics*	6	6
	17½	18½

Junior Year

C. E. (23), *Fluid Mechanics*		3
E. E. 37-38, *Electrical Machinery*	4	4
M. E. 7-8, *Mechanics*	4	4
M. E. 19-20, *Mechanical Engineering Materials*	3	2
M. E. 23-24, *Thermodynamics*	3	3
M. E. 29-30, *Mechanical Laboratory*	2	2
M. E. 59, 60, *Mechanical Engineering Seminar*	½	½
Approved Elective	3	
	19½	18½

Senior Year

Engl. 23, *Writing of Technical Reports*	2	
M. E. 15-16. *Machine Design*	3	3
M. E. 51, *Mechanical Laboratory*	2	
M. E. 53-54, *Power Plants*	2	3
M. E. 55-56, *Internal Combustion Engines*	3	3
M. E. 61, 62, *Mechanical Engineering Seminar*	½	½
M. E. 65, *Engineering Economy*	3	
M. E. 66, *Industrial Management*		3
Approved Elective	3	5
	18½	17½

MECHANICAL ENGINEERING

(For students who enter as freshmen after June, 1958)

Sophomore Year	First Semester Credits	Second Semester Credits
R.O.T.C.	1½	1½
Math. 23, *Technology Mathematics III*	5	
Math. 24, *Differential Equations*		3
M. E. 17-18, *Manufacturing Processes and Design*	3	3
M. E. 25, *Statics*	2	
M. E. 26, *Dynamics*		3
Phys. 23-24, *General Physics II and III*	4	4
*Social-Humanistic	3	3
	18½	17½

Junior Year		
E. E. 39-40, *Electrical Engineering*	4	4
M. E. 33, 34, *Thermodynamics*	3	3
M. E. 35, *Strength of Materials*	3	
M. E. 36, *Fluid Mechanics*		3
M. E. 37, 38, *Mechanical Laboratory*	1	2
*Social-Humanistic	3	3
*Technical Elective	3	3
	17	18

Senior Year		
E. E. 41, *Electrical Engineering*	3	
M. E. 39, *Engineering Materials*	3	
M. E. 41-42, *Mechanical Engineering Seminar*	1	1
M. E. 43-44, *Machine Design and Analysis*	3	3
M. E. 57-58, *Heat and Power Systems*	4	4
M. E. (65), *Engineering Economy*		3
*Social-Humanistic	3	3
*Technical Elective	3	3
	20	17

See page 119 for freshman requirements.

* Social-Humanistic and Technical Elective courses must be approved by the Department.

TECHNOLOGY CURRICULUM IN PHYSICS

(For students who will complete requirements for degrees before September, 1961)

SOPHOMORE YEAR

	First Semester Credits	*Second Semester Credits*
R.O.T.C.	1½	1½
Econ. 1-2, *Economics*	3	3
Math. 17-18, *Calculus*	3	3
Ger. 1-2, *German*	3	3
Phys. 21-22, *General Physics*	6	6
	16½	16½

JUNIOR YEAR
(1958-59 only)

	First Semester Credits	*Second Semester Credits*
Math. 19, 20, *Differential Equations, Applied Mathematics*	3	3
Phys. 31-32, *Physical Mechanics*	4	4
Phys. 33-34, *Electricity and Magnetism*	4	4
Phys. 35-36, *Experimental Physics I and II*	2	2
*Approved Elective	6	6
	19	19

SENIOR YEAR
(1958-59 only)

	First Semester Credits	*Second Semester Credits*
Phys. 91-92, *Modern Physical Theories*	3	3
Phys. 93-94, *Introduction to Theoretical Physics*	3	3
Phys. 95-96, *Advanced Laboratory*	2	2
Math. 65-66, *Advanced Calculus*	3	3
†E. E. 59, *Electron Tubes and Devices*	4	
*Approved Elective	4	8
	19	19

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* Electives may be selected from the following list: Biology 1-2; English 13, 14, 15, 16, 23, 25; French 1, 2; Geology 1, 2, 7; Geography 1, 2, 3, 4; German 1, 8; Government 1, 2, 4, 7, 8; History 1, 2, 7, 8, 19, 20, 21, 22, 32; Humanities 1, 2; Sociology 1, 3, 34, 39, 43, or others if approved by the Department of Physics.

† Substitute Phys. 38 in 1958-59.

TECHNOLOGY CURRICULUM IN PHYSICS

(For students who enter as
freshmen after June, 1958)

Freshman Year	*First Semester Credits*	*Second Semester Credits*
P. E. 31, 32	½	½
R.O.T.C.	1½	1½
Engl. 1-2, *Freshman English*	3	3
Chem. 3, 4, *General Chemistry*	4	4
Math. 21-22, *Technology Mathematics I and II*	5	5
Phys. 18, *General Physics I*		4
Non-Technical Elective	3	
	17	18

Sophomore Year		
R.O.T.C.	1½	1½
Math. 23, *Technology Mathematics III*	5	
Math. 24, *Differential Equations*		3
Phys. 23-24, *General Physics II and III*	4	4
Ger. 1-2, *German*	3	3
Non-Technical Elective	3	6
	16½	17½

Junior Year		
*Math. 51-52, *Advanced Calculus*	3	3
Phys. 31-32, *Physical Mechanics*	4	4
Phys. 33-34, *Electricity and Magnetism*	4	4
Non-Technical Elective	3	3
†Technical Elective	3	3
Phys. 35-36, *Experimental Physics I and II*	2	2
	19	19

Senior Year		
Phys. 91, 92, *Atomic Physics, Nuclear Physics*	4	4
‡Phys. 93, 94, *Theoretical Physics I and II*	5	5
Phys. 95-96, *Experimental Physics III and IV*	3	3
Non-Technical Elective	3	3
§Technical Elective	3	3
Phys. 97, 98, *Colloquium*	1	1
	19	19

(Not open to Seniors in 1958-59)

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* Substitute Math. 19-20 in 1958-59.

† Phys. 37, Modern Physics; Phys. 38, Physical Electronics; Math., or other suitable approved elective.

‡ Phys. 81, Physical Optics, and Phys. 82, Thermodynamics, may be substituted for Phys. 93-94, with the express permission of the Department.

§ Phys. 81, Physical Optics; Phys. 82, Thermodynamics; Electronics in E.E.; Math.; or other suitable approved elective.

The Graduate School

The Graduate School, which has offered instruction since 1903, has for its objective the bringing together of faculty and qualified students in a spirit of scholarship and research. The graduate student is given opportunity to specialize in some field of knowledge, and to develop a maturity of thought and attitude toward his professional field, so that both his professional and his cultural life are enhanced. Graduate work is offered by 29 departments in all three Colleges of the University. The work of the Graduate School is under the general direction of the Graduate Faculty. The Dean of the Graduate School is responsible for the administration of the regulations and requirements pertaining to admission, conduct of work, the granting of advanced degrees. and other pertinent matters.

Degrees

Graduate programs are offered by the following departments: Agricultural Economics, Agricultural Education, Agronomy, Animal Science, Bacteriology, Biochemistry, Botany, Chemical Engineering, Chemistry, Civil Engineering. Dairy Science, Electrical Engineering, Entomology, Forestry, Home Economics, Horticulture, Mathematics, Mechanical Engineering, Physics, Poultry Science, and Zoology leading to the Master of Science degree; Economics, English, Government, History, Languages, Psychology, and Sociology leading to the Master of Arts degree; and Education leading to the Master of Education degree. A program also is available leading to the Master of Agricultural Education degree. Graduate programs leading to the Doctor of Philosophy degree are offered in the Departments of Botany, Chemistry, Horticulture, and Zoology.

Assistantships and Scholarships

Graduate assistantships are available in several departments. These involve work in research, teaching, general service, or some combination thereof. Scholarships are also available. These provide exemption of tuition charges.

Information

Detailed information about admission, requirements for degrees, courses. scholarships, and assistantships are to be found in the Graduate School catalogue which may be obtained by writing to the Dean of the Graduate School.

Description of Courses

EXPLANATION OF ARRANGEMENT

The title of the course is given in small capital letters; the arabic numeral designates the particular course. Odd numerals indicate courses normally offered in the first semester; even numerals indicate courses normally offered in the second semester. Arabic numerals enclosed in parentheses indicate that a course is repeated in the semester following. Thus course 1 (1) is offered in the first semester and is repeated in the second semester.

Every course is assigned to one of 23 examination groups. As all courses in the same examination group have their final examinations at the same time, a student may not register for two courses with the same examination number. Courses with examination group number 0 have no final examination, so that more than one course in this group may be scheduled by a student. For the examination group number of each course, see the time and room schedule.

Courses numbered 1-50 cannot be counted for graduate credit. Courses numbered 51-99 are for juniors, seniors, and graduate students. They are not open to freshmen and sophomores. Descriptions of courses over 100, which are for graduate students only, will be found in the Graduate School catalogue.

Following the title is the course description and the name of the instructor. The next section gives the following information in the order indicated: (1) prerequisites, if any; (2) the number of hours of recitations or laboratory periods required each week; (3) the number of semester credits the course will count in the total required for graduation. Lectures and recitations are fifty minutes in length. Laboratory periods are usually two and one-half hours in length.

Abbreviations have been employed to indicate the number of hours of work required of students in lecture, recitation, and laboratory, and the number of credits given for satisfactory completion of each course. The abbreviations should be interpreted as follows:

Cr.	Semester hour credit
Lab.	Laboratory
Lec.	Lecture
Prereq.	Prerequisites
Rec.	Recitation

All courses (unless otherwise marked) are open to students who have passed the prerequisites.

An elective course will be given only when there is a minimum of five students registered.

If the numerals designating a course running through both semesters are connected by a hyphen, the first semester, or its equivalent, is a prerequisite for the second semester. If the numerals are separated by a comma, properly qualified students may take the second semester without having had the first.

Students must register for the number of credits or within the range of credits shown in the catalogue description of a course.

AGRICULTURE

A grouping of non-departmental courses

DEAN'S OFFICE, COLLEGE OF AGRICULTURE

1. ORIENTATION. A non-departmental course offering an opportunity to discuss matters not ordinarily reviewed in other courses of instruction. Attention will be given to selected student rules and regulations, scholarships, campus organizations and facilities, opportunities in agriculture as a science, and to programs of study. Also, federal aid as related to land-grant colleges and universities will be discussed. Mr. Richards. Required of first-semester freshmen in Agriculture, Forestry, and Home Economics. 1 lec.; 1 cr.

COOPERATIVE EXTENSION SERVICE

3. PRINCIPALS OF COOPERATIVE EXTENSION WORK. The development, legal basis, description of projects and operations of field staff, methods of influencing people through meetings, demonstrations, publicity, radio, and visual aids. Mr. James and other members of the staff of the Cooperative Extension Service. Open to juniors and seniors in Agriculture and Home Economics by permission of the instructor. (Alternate years; offered in 1958-59.) 2 lec.; 2 cr.

4. EXTENSION FIELD WORK. To provide practical experience in extension work, a limited number of Agriculture and Home Economics students may be permitted to do some supervised extension work under the immediate direction of a member of the staff of the Cooperative Extension Service. This may be taken during the second semester of the junior or senior year. In some cases arrangements may be made for supervised work during the summer vacation period. Preference may be given to students who have taken Agriculture 3. Mr. James. 2 to 6 cr.

AGRICULTURAL EDUCATION

89-90. METHODS OF TEACHING FARM MECHANICS IN VOCATIONAL AGRICULTURE. This course deals with the organization and presentation of farm mechanics subject matter, supervision and direction of farm mechanics projects, and the preparation and presentation of demonstrations. The first semester deals with fundamental farm mechanics skills and the second semester with farm machinery maintenance and operational techniques of instruction. Mr. Gilman. Required of majors in Teacher Preparation curriculum. 1 lab.; 1 cr.

91-92. PROBLEMS IN TEACHING VOCATIONAL AGRICULTURE. The course will cover in considerable detail the following topics: the vocational point of view, building the course of study in agriculture, providing teaching facilities, planning the lesson, and planning supervised farming programs, Future Farmers of America, young farmer program, adult farmer programs, and miscellaneous activities of the teacher of agiculture. Mr. Barton. Required of juniors or seniors in Teacher Preparation curriculum. 2 lec.; 1 lab.; 3 cr.

93, (93). SUPERVISED TEACHING IN VOCATIONAL AGRICULTURE. This course provides the trainee with the opportunity for obtaining participating experience in teaching vocational agriculture under the guidance of a critic-teacher. The enrollee is required to assume the duties and responsibilities expected of the regular teacher of agriculture before the work for the semester is concluded. Mr. Barton. 17 cr.

DESCRIPTION OF COURSES

ACCOUNTING

(*See Economics and Business Administration*)

BIOCHEMISTRY

Arthur E. Teeri, *Professor;* Thomas G. Phillips, *Professor Emeritus;* Stanley R. Shimer, *Professor;* Margaret E. Loughlin, *Assistant Professor;* Douglas G. Routley, *Assistant Professor*

1. Organic and Biological Chemistry. An introduction to organic chemistry and a brief survey of biological chemistry. Mr. Shimer, Miss Loughlin. Prereq.: Chem. 2 or 4. 3 lec.; 2 lab.; 5 cr.

2. Plant Chemistry. The chemistry of plant growth. Mr. Routley. Prereq.: Biochem. 1 or its equivalent. 2 lec.; 1 lab.; 3 cr.

4. Animal Nutrition. The chemistry of animal nutrition. Mr. Shimer. Prereq.: Biochem. 1 or its equivalent. 2 lec.; 1 lab.; 3 cr.

6. Chemistry of Food and Nutrition. The chemistry of food materials and of digestion, absorption, metabolism, and excretion, Miss Loughlin. Prereq.: Biochem. 1 or its equivalent. 2 lec.; 1 lab.; 3 cr.

51-52. Physiological Chemistry. The chemistry of fats, carbohydrates, and proteins; colloids, enzymes, digestion, metabolism, and excretion. The qualitative and quantitative examination of blood and urine. Mr. Shimer, Mr. Teeri. Prereq.: Satisfactory preparation in organic chemistry and quantitative analysis. 3 lec.; 2 lab.; 5 cr. Under special conditions a student may register for the lectures in this course (3 cr.) after obtaining the consent of the instructor and approval of the Dean of the College.

53-54. Agricultural Analysis. A study of the methods of analysis of soils, fertilizers, feeding stuffs, and other products important in agriculture. Mr. Teeri and staff. Prereq.: Satisfactory preparation in organic chemistry and quantitative analysis. 1 lec.; 3 lab.; 4 cr.

56. Physiological Chemistry. The qualitative and quantitative methods fundamental to medical diagnostic work. The chemistry of fats, carbohydrates, and proteins; enzymes, digestion, metabolism, and excretion. Mr. Teeri. Prereq.: Satisfactory preparation in organic chemistry. 3 lec.; 2 lab.; 5 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

AGRICULTURAL ECONOMICS

William F. Henry, *Professor;* James R. Bowring, *Associate Professor;* William H. Drew, *Associate Professor*

12. Economics of Agriculture. A survey of economics as related to the agricultural industry. Includes the nature of farming costs and farm prices, the economics of marketing, the economic bases of consumer decision making, and agricultural policy. Mr. Henry. 3 lec.; 3 cr.

14. Farm Management. Principles of managing farms for maximum income, including methods of making management decisions; enterprise selection and resource combination; adjustment to prices; management of land,

labor, and equipment; obtaining capital; farm planning; records and analysis of performance. The principles are applied to several kinds of farms through examples, laboratory problems, and farm visits. Open to juniors and seniors. 3 lec.; 1 lab.; 4 cr.

34. ECONOMICS OF CONSUMPTION. The significance of consumer decisions about spending and saving to the economy. Budgeting and decision making in the major categories of consumer purchases. Factors influencing consumer choice, including prices, grades, and standards. Changing food needs and their relation to production and marketing problems. Problems of maximizing consumer satisfaction. Mr. Bowring. Prereq.: Econ. 1, or permission of instructor. 3 lec.; 3 cr.

51. COOPERATIVE BUSINESS. Stress is placed on the organizational, legal, and financial problems of farmers' business corporations engaged in buying and selling. Selected problems of general agricultural marketing are integrated with the course content. Mr. Henry. 3 lec.; 3 cr.

54. AGRICULTURAL FINANCE. The capital needs of different kinds of farms and farmer organizations. Saving, credit, renting, partnerships, and other means of obtaining capital. Organization, practices, and problems of credit institutions serving agriculture. The valuation and appraisal of farm property. Prereq.: Ag. Econ. 14 or concurrently. 2 lec.; 2 cr. (Alternate years; not offered 1958-59.)

55. AGRICULTURAL MARKETING. The market structure for the distribution of agricultural products will be reviewed. Attention will be given to consumer demand, prices, and the efficiency of firms handling farm products. Each student is encouraged to study in detail a product of his or her particular interest. Mr. Bowring. 3 lec.; 3 cr. (Alternate years: not offered 1958-59.)

60. AGRICULTURAL POLICY. The study of problems peculiar to agriculture which are the basis for government and private policies in the production and sale of agricultural products. Prices, production control, marketing agreements, conservation, and farm credit will be appraised in relation to their contribution to accepted objectives of price stability and farm family living. Mr. Drew. Prereq.: 6 hours of economics or agricultural economics. 3 lec.; 3 cr.

67, 68. SPECIAL PROBLEMS. Special assignments in reading and problems to satisfy students' needs. Mr. Henry, Mr. Bowring, and Mr. Drew. Prereq.: special permission. 1 to 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

AGRICULTURAL ENGINEERING

JOHN J. KOLEGA, *Associate Professor;* GORDON L. BYERS, *Associate Professor;* PAUL A. GILMAN, *Associate Professor of Farm Mechanics, Thompson School of Agriculture*

2. RESIDENCE PLANNING. The considerations involved in building or buying a house to fit one's needs. Problems in selecting and applying typical materials to residence construction. 1 lec.; 1 lab.; 2 cr.

15. AGRICULTURAL ENGINEERING SHOP. Designed to give engineering students an appreciation of the problems of manufacturing and repair. Practice

in oxy-acetyline and electric arc yelding, machining and cold metal work, soldering, pipe fitting, and the care and use of woodworking tools. Mr. Gilman. Registration limited to Agricultural Engineering students. 1 lab.; 1 cr.

17, 18. FARM SHOP. Primarily for teacher-training students. The selection, care, and use of tools needed for modern farm operation and maintenance, with practice in basic tool operations. The development of skills in handling tools for maintenance and construction work on the farm. Mr. Gilman. 2 labs.; 2 cr.

21. SOIL AND WATER CONSERVATION. Elementary surveying and its application to practical agricultural problems; the design and layout of drainage, erosion control, and irrigation systems. 1 lec.; 1 lab.; 2 cr.

22. FARM POWER. A study of engines in farm work and how they may be used to the best advantage. 1 lec.; 1 lab.; 2 cr.

23. FARM MACHINERY. A study of the mechanism of agricultural production machinery, its selection, care, performance, and use. 1 lec.; 1 lab.; 2 cr.

24. FARM STRUCTURES. Problems in planning and designing agricultural structures, estimating materials and costs, discussion of preliminary considerations for various types of structures. 1 lec.; 1 lab.; 2 cr.

25. FARM AND HOME UTILITIES. The application of electrical energy to labor-saving equipment and lighting on the farm or in the home. The planning of farmstead and residential wiring. Home heating and sanitation are also discussed. 1 lec.; 1 lab.; 2 cr.

Note: Courses 31 through 40 are primarily for Agricultural Engineering majors and Technology students.

31. SOIL AND WATER ENGINEERING. A study of the hydrologic, soil, vegetal. and stream flow factors involved in the design and operation of erosion control structures, drainage systems. and irrigation systems. Prereq.: C.E. 23. 2 lec.; 1 lab.; 3 cr.

32. FARM TRACTORS. The design and operation of farm tractors. A study of tractor power units, chassis mechanics, tractor tests, and performances. Prereq. or concurrent: M.E. 8; M.E. 23. 2 lec.; 1 lab.; 3 cr.

33. FIELD MACHINERY. The design of the engineering elements of farm machinery. The study of the capacity and power requirements of farm implements. Prereq. or concurrent: M.E. 8. 2 lec.; 1 lab.; 3 cr.

34. AGRICULTURAL STRUCTURES. The functional planning and structural design of farm buildings and residences; problems arising from the physiological processes of animals and crops. Prereq.:M.E. 8; M.E. 24. 2 lec.; 1 lab.; 3 cr.

(35.) RURAL ELECTRIFICATION. The utilization of electrical energy on farms for power, illumination, and temperature control, including the study of equipment used in crop processing, water systems, materials handling, and the design of a farmstead wiring system. Prereq.: E.E. 33. 2 lec.; 1 lab.; 3 cr.

41, 42. SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING. Guided but independent activities in special areas of agricultural engineering by students capable of self-direction. Prereq.: senior standing. 1-3 cr.; time to be arranged.

AGRONOMY

(Soils and Farm Crops)

Allen B. Prince, *Associate Professor;* Ford S. Prince, *Professor Emeritus;* Leroy J. Higgins, *Associate Professor;* Noble K. Peterson, *Associate Professor;* Gerald M. Dunn, *Associate Professor*

1. Introductory Crop Production. The production, distribution, cultural practices, improvement, and uses of field crops, such as forage, grain, and tuber crops. Mr. Higgins. 2 lec.; 1 lab.; 3 cr.

11. Introductory Soils. A study of the physical, chemical, and biological properties of soils in relation to plant growth. Mr. Peterson. 3 lec.; 1 lab.; 4 cr.

14. Introductory Soil Fertility. The use of lime, fertilizers, farm manures, and green manures as they influence the yield of field and truck crops. Mr. Peterson. Prereq.: Agron. 11. 3 lec.; 3 cr.

24. Cereal and Other Grain Crops. A study of the characteristics and production of corn, oats, barley, rye, and other feed and grain crops. Mr. Higgins. Prereq.: Agron. 1 and a minimum of 3 other credits in Agronomy or permission of instructor. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1958-1959.)

25. Seed Testing. The identification of seeds and a study of the techniques used in official methods of sampling and analyzing agricultural seeds for purity and germination. Mrs. Sanborn, Seed Analyst. Prereq.: Bot. 1 and permission of instructor. 1 lab.; 1 cr.

26. Potatoes and Other Cash Crops. A study of the characteristics and production of potatoes, field beans, sweet corn, and other cash crops. Mr. Higgins. Prereq.: Agron. 1 and a minimum of 3 other credits in Agronomy or permission of instructor. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1958-1959.)

28. Forage and Pasture Crops. A study of the grasses and legumes used as hay, pasture, and silage, and the methods of handling these crops for maximum yield of high-quality forage. Mr. Higgins. Prereq.: Agron. 1 and a minimum of 3-6 other credits in Agronomy or permission of instructor. 2 lec.; 1 lab.; 3 cr.

51. Pasture-Hayland and Turf Management. The choice of species and the preparation and maintenance of stands and swards through adequate management and fertilization. Consideration also will be given to lawns and turf areas. Current research literature, individual problems, and field trips will be utilized. Mr. Higgins. Prereq.: Agron. 28 and a minimum of 6 other credits in Agronomy or permission of the instructor. 2 lec.; 1 lab.; 3 cr.

52. A Review of Agronomy. Principles and practices in agronomic crop production, including the management of soils and the use and response of lime and fertilizers. For teachers of vocational agriculture and other students with the permission of their advisers. Mr. Higgins and staff. Summer Session only — offered in 1961. Two hours daily, lec. and lab.; 2 cr.

56. Soil Physics. Physical properties of soils; their measurement and relation to structure, water movement, aeration, and temperature. Prereq.: Agron. 11, 14, and Phys. 2, and permission of instructor. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1958-1959.)

58. Soil Classification and Mapping. The genesis, morphology, classification and mapping of soils. Mr. Peterson. Prereq.: Agron. 11 and Geol. 7. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1958-1959.)

59. Soil Chemistry. A study of the methods of evaluating nutrient levels in soils and of principles underlying the liberation, absorption, and fixation of nutrient elements in soils. Mr. Prince. Prereq.: Biochem. 1, Agron. 11, 14, and permission of instructor. 3 lec.; 1 lab.; 4 cr. (Alternate years; offered 1958-1959.)

60. Soil and Water Conservation. Management of soil and water in accordance with the needs and capabilities of the land. Mr. Peterson. Prereq.: Agron. 1, 11. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1958-1959.)

62. Plant Breeding of Field Crops. A study of methods for developing and evaluating improved varieties of grasses, legumes, and cereal crops. Major emphasis will be given to corn breeding. Laboratory will consist of practical work in selfing and crossing, inheritance studies, and statistical analysis of experimental plot designs. Mr. Dunn. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1958-1959.)

71, 72. Agronomy Seminar. Library and reference work on special phases of soil and crop problems. Practice in looking up literature and in preparation and presentation of reports and abstracts. Staff. Prereq.: Agron. 1, 11, and 14. Required each semester of seniors and graduate students majoring in Agronomy; elective for other qualified students. 1 cr.

75, 76. Special Problems.

a. Crop Production — Mr. Higgins
b. Plant Breeding — Mr. Dunn
c. Soil Chemistry — Mr. Prince
d. Soil Physics —

Elective only after consultation with the instructor in charge. Hours to be arranged. 1-4 credits.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

ANIMAL SCIENCE

Loring V. Tirrell, *Professor;* Fred E. Allen, *Professor;* Gerald L. Smith, *Assistant Professor;* Harold E. Kimball, *Riding Instructor*

2. Types and Market Classes of Livestock. Origin, history, development, characteristics, and adaptability of the different types of horses, cattle, sheep, and swine, with practice in judging. Mr. Tirrell and Mr. Smith. 2 lec.; 1 lab.; 3 cr.

11. Livestock Judging. The principles and practice of judging horses, beef cattle, sheep, and swine. It includes trips to some of the best New England breeding establishments and is required of candidates for judging teams. Mr. Smith. 1 lab.; 1 cr.

13. Feeds and Feeding. The character, composition, and digestibility of feed stuffs and the principles and methods of feeding different kinds of farm animals. Mr. Smith. 3 lec.; 3 cr.

14. ADVANCED LIVESTOCK JUDGING. A continuation of Animal Science 11. It serves as a basis for the selection of a livestock team for competition such as held at the Eastern States Exposition and the International at Chicago. Mr. Smith. Prereq.: An.S. 11. 1 lab.; 1 cr.

15. SYSTEMATIC ANATOMY. The general anatomy and physiology of domestic animals. Mr. Allen. 3 lec.; 3 cr.

16. ANIMAL DISEASES. The prevention, control, and treatment of the bacterial and parasitic diseases of domestic animals. Mr. Allen. Prereq.: An.S. 15. 3 lec.; 3 cr.

18. MEAT AND ITS PRODUCTS; LIVESTOCK MARKETS. A study of meat, farm slaughter, curing and identification of cuts, livestock markets, stockyards, and transportation, with occasional trips to slaughter houses and packing plants. Mr. Smith. 1 lec.; 1 lab.; 2 cr.

19. MANAGEMENT OF BEEF CATTLE AND SWINE. Selection, feeding, breeding, management, and preparation for the show ring of beef cattle and swine with special reference to New England conditions. Mr. Tirrell and Mr. Smith. 2 lec.; 1 lab.; 3 cr.

20. SHEEP HUSBANDRY. Selection, breeding, feeding, management, and preparation for the show ring of sheep, with special reference to New England conditions. Mr. Tirrell and Mr. Smith. 2 lec.; 1 lab.; 3 cr.

21. LIGHT HORSE HUSBANDRY. Origin, history, development, judging, selection, feeding, breeding, and management of light horses. Special emphasis will be placed upon saddle-horse selection, the show ring classes, and judging. Horse show management will be discussed. Mr. Tirrell and Mr. Smith. 1 lec.; 1 lab.; 2 cr.

23. HORSEMANSHIP. Instruction in riding using University-owned Morgans under supervision of a special riding instructor. It is possible for a limited number of students to stable their horses at the University upon proper authorization. Any student wishing to use this course to satisfy an activity requirement in Physical Education for Women will register for Physical Education 1, 2, 3, 4, 5 or 6. Two one-hour or one two-hour riding periods per week for which a fee of $25 per quarter is charged. 1 cr. Mr. Kimball.

51. ANIMAL BREEDING. The principles and practices of breeding farm animals, including cross-breeding, in-breeding, selection, inheritance, breed analysis, reproductive efficiency, fertility, and sterility. Mr. Smith. 3 lec.; 3 cr.

52. ANIMAL SCIENCE SEMINAR. Library and reference work and preparation of papers on various Animal Science subjects of timely importance. Mr. Tirrell. 1 to 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

DESCRIPTION OF COURSES

THE ARTS

George R. Thomas, *Professor;* Edwin Scheier, *Associate Professor;* John W. Hatch, *Associate Professor;* Wesley F. Brett, *Assistant Professor;* Richard D. Merritt, *Assistant Professor;* John Laurent, *Assistant Professor;* Anne Henderson, *Assistant Professor;* Alec W. Finlayson, *Instructor;* Winifred Clark, *Instructor;* Nancy Talbot, *Instructor;* John B. O'Reilly, *Instructor;* Arthur R. Koch, *Instructor;* Hugh Pritchard, *Visiting Lecturer*

Visiting Lecturers in Clinical Subjects

Paul Colokathis, M.D., *Physical Disabilities;* Charles H. Howarth, B.S., M.D., *General Medical and Surgical Conditions, Ophthalmology and Otology, Tuberculosis;* Gerhard Nothman, M.D., *Psychiatry;* Gerald Shattuck, M.D., *Pediatrics.*

Supervisors in Student Affiliation

Miss Norma Alessandrini, Miss Theresa Anema, Miss Barbara Armstrong, Miss Margaret M. Bishop, Miss Margaret Blodgett, Miss Patricia Calef, Miss Marjorie Canada, Miss Jean Coffin, Miss Eileen Dixey, Miss Elsie L. Doran, Miss Mary Fiorentino, Miss Jane Fogelsonger, Miss Joan S. Gale, Mrs. Gertrude Grenier, Miss Jessie Kindel, Miss Beverly Konugress, Miss Mildred E. Knipe, Miss Lucille L. Lacy, Mrs. Haru Lemke, Miss Helen P. Lindley, Miss Louise McMillan, Miss Anne Miller, Miss Jane E. Myers, Miss Irene Obrock, Miss Ruth E. Oltmann, Miss Janet Patterson, Miss Suzanne G. Picard, Mrs. Theresa Pratt, Mrs. Marshall Price, Miss Charlotte A. Prudich, Mr. Donald E. Rawe, Miss Cecilia Sattely, Miss Elizabeth Scully, Miss Lucille Schweider, Miss Elizabeth Smedes, Miss Elizabeth Stanley, Mrs. Janice Stark, Miss Viola Svensson, Miss Joan Tonks, Miss Elaine Utley, Miss Dorothy E. Whitford, Miss Dorothy Yeager, Miss Michi Yasamura, Mrs. May I. Yokiyama; Miss Ruth M. Zieke.

Exhibitions and Art Trips. The Department promotes on the campus a series of exhibitions and lectures treating The Arts, and visits to near-by museums and points of interest are arranged from time to time. The following are a few of the art centers within a convenient radius of Durham: Addison Gallery of American Art, Currier Gallery of Art, Lamont Gallery, and several excellent museums and galleries in Boston, including the Boston Museum of Fine Arts, the Gardner Museum, the Fogg Museum at Harvard University, and the Institute of Contemporary Art.

Student Workshop. An experimental arts laboratory located in Hewitt Hall, is open to any student in the University, whether or not enrolled in art courses. This laboratory provides an excellent environment in which a student may explore materials, plan, and execute projects of his own choice. Excellent facilities, including equipment ranging from small craft tools to industrial type machines, are provided. Mr. Brett.

General Courses in The Arts

In those courses where the students retain finished products, they pay the costs of materials used. The Department of The Arts reserves the right to retain for exhibition purposes two examples of each student's work in each class of instruction.

Students are responsible in the care of shops, studios, and all equipment therein; damage resulting through negligence or carelessness will be the responsibility of the student. Tools and other equipment will not be used until instruction in their use is given by the member of the staff in charge.

Unless otherwise authorized by the instructor, projects not a part of the instructional program will be excluded from the studios.

3. CRAFTS. Work in leather, metal tooling, chip carving, and other crafts which require little special equipment and which may be carried on in elementary and secondary schools. Problems in design, methods of teaching each craft, sources of materials and tools, and current literature. Miss Clark. *For Art-Education students;* also, elective by permission. 2 lab.; 2 cr.

4. CRAFTS. Craft activities for summer camps, playgrounds, settlement and scout groups. Design and construction in leather, paper, wood, textiles, scrap, and native materials. Special emphasis on methods of teaching and using crafts in camp handcraft programs, sources of materials and tools, and current literature. Miss Clark. *For Recreation Education, Physical Education, and Social Service students;* also, elective by permission. 2 lab.; 2 cr.

5, (5). JEWELERY AND METALWORK. Structural and decorative design and construction in various metals, such as pewter, copper, and silver. This course may be repeated, in which case advanced projects will be assigned. *This course may be taken for credit no more than four times.* Miss Clark. Elective by permission. 2 lab.; 2 cr.

(6). WEAVING. Fundamentals of weaving: warping, threading, basic weaves, patterns. Projects include place mats, scarves, bags, rugs, etc. This course may be repeated, in which case advanced projects will be assigned. *This course may be taken for credit no more than four times.* Miss Clark. Elective by permission. 2 lab.; 2 cr.

(8). TEXTILE DESIGN. Creative design in stenciling, block printing, silk screen printing. This course may be repeated, in which case advanced projects will be assigned. *This course may be taken for credit no more than four times.* Miss Clark. Elective by permission. 2 lab.; 2 cr.

11, (11). MODELING. Modeling in relief and in the round. An introduction to ceramic sculpture and to the processes of firing and glazing. This course may be repeated, in which case advanced projects will be assigned. *This course may be taken for credit no more than three times.* Mr. Scheier. Elective by permission. 2 lab.; 2 cr.

15, 16. CERAMICS. (Pottery). Design and construction of hand-built pottery. Studio practice in construction, decoration, glazing, and firing of slab-built, coil-built pottery and tiles. Mr. Scheier. Elective by permission. 2 lab.; 2 cr.

17, 18. CERAMICS (Pottery). Design and construction of wheel-thrown pottery. Studio practice in throwing, decorating, and firing pottery with emphasis on the preparation and application of glazes. Mr. Scheier. Elective by permission. 2 lab.; 2 cr.

20. ELEMENTARY DRAFTING. Elementary drafting procedures, including lettering and use of instruments. Study of architectural symbols. Interpretation of typical hotel plans and statistical data by graphical representation. Mr. Thomas. *For Hotel Administration students, elective by permission only.* 2 lab.; 2 cr.

23, (23). BASIC DESIGN. A basic course in the structural and expressive use of the elements of design as a background for crafts, ceramics, drawing and painting, and commercial design. A series of related lectures and demonstrations will be scheduled throughout the semester. Mr. Hatch, Mr. Laurent, and Mr. Koch. Elective by permission. 2 lab.; 2 cr.

24. Drawing and Design. A continuation of Arts 23 with problems in three dimensional design and drawing from the model and from nature. A series of related lectures and demonstrations will be scheduled throughout the semester. Mr. Hatch, Mr. Laurent, and Mr. Koch. Prereq.: Arts 23 and permission. 2 lab.; 2 cr.

25, 26. Advanced Drawing and Painting. Drawing is concentrated in the fall semester; extensive drawing in studio and from nature, still life and figure drawing in a variety of media, i.e., pencil, pen, ink and wash, pastel, and watercolor. An introduction to oil painting; composition, means of form description, and theories of color are presented in studio exercises and outdoor sketches in the spring semester. Mr. Hatch and Mr. O'Reilly. Elective by permission only. 2 lab.; 3 cr.

27. Graphic Arts. Expression and experimentation in a variety of graphic techniques, i.e., linoleum and wood block printing, serigraphy, etc., in black and white and color. Mr. Laurent, Prereq.: Arts 23. Elective by permission only. 2 lab.; 3 cr.

28. Advertising Design. Creative design problems in various media and techniques in an introduction to the field of advertising design. Mr. O'Reilly. Prereq.: Arts 23. Elective by permission. 2 lab.; 2 cr. (Alternate years; not offered in 1958-1959.)

29, 30. Advanced Painting and Composition. An extension of Arts 25 and 26, stressing further development in the various media. Figure study and outdoor sketching also will be offered. This course may be taken a second time with emphasis on the particular need of the individual. Mr. Laurent. Elective by permission only. Credits and schedule to be arranged.

31, 32. Introduction to The Arts. A broad historical survey of man's creative efforts in their relation to contemporary cultural and social movements, presented as a background for interpreting the place of the arts in individual and community life of today. Illustrated lectures with assigned readings. Mr. Thomas and Mr. O'Reilly. *Not open to freshmen.* 3 lec.; 3 cr.

35, (35). Stagecraft. The theory and practice of the technical phases of play production, including a study of the design and methods of execution of scenery and lighting. Practice in planning, designing, construction, painting, and lighting of scenery; practical experience in the handling of properties, manipulations of scenery, lighting, and mechanical effects. Mr. Finlayson. Elective by permission. 1 lec. or rec.; 1 lab.; 2 cr.

38. Illustration. Creative design problems in various media and techniques in an introduction to the field of illustration. Mr. O'Reilly. Prereq.: Arts 23. Elective by permission. 2 lab.; 2 cr. (Alternate years; offered in 1958-1959.)

39, (39). Elementary Photography. The theory and practice of photography, covering camera operation, developing, printing, and enlarging. Projects stress imaginative solutions to portraiture, advertising, illustrative, and campus life assignments. Mr. Merritt. Open to sophomores, juniors, and seniors by permission of the instructor. 1 lec.; 1 lab.; 3 cr. (The cost of materials will approximate $8.00.)

40. Advanced Photography. The basic theory and practice of color photography. Advanced projects in black and white. Techniques of creative pho-

tography including studio and laboratory controls. A portfolio of photographs, representative of the student's progress during the course, will be required. Mr. Merritt. Permission of the instructor. 1 rec.; 1 lab.; 3 cr. (The cost of materials will approximate $10.50.) (Alternate years; not offered 1958-1959.)

83. PRIMITIVE, ORIENTAL, AND CLASSIC ART. A study of primitive art from prehistoric caves to Egypt, also Mayan, Negro, and modern primitive arts in general; the development of art in the Far East, especially China and Japan; the development and decline of the classic art of Greece and Rome. The motivation, the relationship to the particular culture, and the influence on modern art of these various art epochs will be stressed. Illustrated lectures with assigned readings. Mr. Hatch. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

85. THE ART OF THE RENAISSANCE. A historic survey of the achievements of Western civilization in sculpture, painting, and architecture from the Gothic cathedral to the 18th century drawing room. Illustrated lectures with assigned readings. Mr. Hatch. 3 lec.; 3 cr. (Alternate years; offered 1958-1959.)

88. MODERN ART. From Louis XVI to Picasso; traces the history of painting through the various revolutions, political and aesthetic, that resulted in the many schools of thought prevalent in 19th and 20th century art; i.e., classicism, impressionism, cubism, etc. Illustrated lectures with assigned readings. Mr. Hatch. 3 lec.; 3 cr.

99, (99). PROBLEMS IN THE VISUAL ARTS. Advanced students may select a special problem in one of the visual arts in which they have exhibited proficiency, to be developed by means of conferences and studio work. Mr. Thomas and staff. Prereq.: Permission of Department Chairman. Credits to be arranged. *This course may be repeated to a total of not more than 6 credits.*

ART-EDUCATION (ART-ED.) 91. PROBLEMS OF TEACHING ART IN ELEMENTARY SCHOOLS. The purposes and objectives of teaching art in elementary schools; selection and organization of teaching material; teaching techniques which may be advantageously employed in the elementary schools. Mr. Thomas. Open only to students in the Art-Education curriculum. Prereq.: Educ. 58 with grade of C or better. 2 rec.; 1 lab.; 3 cr.

ART-EDUCATION (ART-ED.) (92). PROBLEMS OF TEACHING ART IN SECONDARY SCHOOLS. The purpose and objectives of teaching art in the secondary schools; selection and organization of teaching material; teaching techniques which may be advantageously employed in the secondary-school art program. Mr. Thomas. Open only to students in the Art-Education curriculum. Prereq.: Educ. 58. with a grade of C or better. 2 rec.; 1 lab.; 3 cr.

EDUCATION-ART (ED-ART) 94. SUPERVISED TEACHING IN ART. Prereq.: Art.-Ed. 92. One semester of supervised Teaching. 14 cr.

Selection from the following courses offered by several departments within the University may, with the consent of the Chairman of the Department and the College Dean, be counted toward a major program in The Arts.

COSTUME DESIGN AND FASHION ILLUSTRATION. *See* HOME ECONOMICS
FLORAL ARRANGEMENT. *See* HORTICULTURE
HISTORY OF COSTUME. *See* HOME ECONOMICS
HOME DECORATION. *See* HOME ECONOMICS
INTERIOR DECORATION. *See* HOME ECONOMICS

PRINCIPLES OF CLOTHING CONSTRUCTION. *See* HOME ECONOMICS
TEXTILES. *See* HOME ECONOMICS
TEXTILES AND FURNITURE. *See* HOME ECONOMICS

For courses in music, dramatic art, and dancing, see departments of Music, English, and Physical Education for Women.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

BACTERIOLOGY

LAWRENCE W. SLANETZ, *Professor;* THEODORE G. METCALF, *Associate Professor;* WILLIAM A. AYERS, *Assistant Professor*

1. GENERAL BACTERIOLOGY. Principles of bacteriology; morphology, physiology, and classification of bacteria and other microorganisms, and their relationship to agriculture, industry, sanitation. and infectious diseases. Mr. Slanetz, Mr. Metcalf, and Mr. Ayers. Prereq.: Chem. 1-2 or equivalent. 2 lec.; 2 lab.; 4 cr.

2. FOOD AND SANITARY BACTERIOLOGY. Relation of microorganisms to food production; food preservation; food infections and intoxications; standard laboratory methods for the bacteriological examination of foods. Bacteriology and sanitation of milk, water, sewage, air, and eating utensils. Disinfection and disinfectants. Mr. Slanetz and Mr. Ayers. Prereq.: Bact. 1. 2 lec.; 2 lab.; 4 cr.

5. PUBLIC HEALTH AND SANITATION. A consideration of the nature and types of microbes causing infectious diseases; the prevalence, transmission, and control of these diseases. Sanitation of water, sewage, food, and air. Community hygiene and public health administration. Mr. Slanetz. Prereq.: Biol. 1-2, or consent of instructor. 3 lec. or demonstrations; 3 cr.

6. SOIL BACTERIOLOGY. Consideration will be given to the nature and types of bacteria and other microorganisms present in soil and to their activities in carrying out decomposition of plant and animal matter; their role in the nitrogen, carbon, and sulfur cycle in soil; their relationship to other soil inhabitants; and their contribution to soil fertility. Mr. Ayers. Prereq.: Bact. 1. 2 lec.; 2 lab.; 4 cr. (Alternate years; not offered 1958-1959.)

8. PATHOGENIC BACTERIOLOGY. A study of the morphological, cultural, biochemical, serological, and pathogenic characteristics of microorganisms causing human and animal diseases. Mr. Metcalf. Prereq.: Bact. 1. 2 lec.; 2 lab.; 4 cr.

53. IMMUNOLOGY AND SEROLOGY. The theories of infection and immunity; production of vaccines, toxins, and antiserums; serological techniques for disease diagnosis and identification of bacteria, including agglutination, precipitin, and complement fixation tests. Mr. Metcalf. Prereq.: Bact. 8. 2 lec.; 2 lab.; 4 cr.

54. INDUSTRIAL MICROBIOLOGY. Consideration of the role of microorganisms important in industrial processes. Isolation and study of the bacteria, yeasts, molds, and actinomycetes used for the manufacture of industrial products. Discussion of the theoretical aspects of fermentation and respiration and their

practical applications. Typical industrial processes employing microorganisms. Mr. Ayers. Prereq.: Bact. 1 and organic chemistry. 2 lec.; 2 lab.; 4 cr. (Alternate years; offered 1958-1959.)

55, 56. PROBLEMS IN BACTERIOLOGY. Special problems, depending upon the training and desire of the student. Elective only upon consultation. Mr. Slanetz and members of the staff. Credits to be arranged.

57, 58. BACTERIOLOGY SEMINAR. Reports and discussions on current literature and recent developments in bacteriology. Mr. Slanetz and members of the staff. Prereq.: Bact. 2 or 8 and consent of the instructor. 1 2-hr. period; 1 cr.

60. VIROLOGY. An introduction to the animal and plant viruses including bacteriophages and the rickettsiae. A consideration of techniques, pathogenesis, immunity, and host-virus relationships. Mr. Metcalf. Prereq.: Bact. 8. 1 lec.; 3 lab.; 4 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

BIOLOGY

1-2. MAN AND THE LIVING WORLD. This is a basic course in biology, designed to give the student fundamental facts about himself and an understanding of his relation to the living world, both plant and animal, of which he is a part. Staffed from the Zoology Department with Mr. Swan as course chairman, and with the Biological Science Division serving in an advisory capacity. 2 rec.; 1 lab.; 3 cr. *This course cannot be used to satisfy major requirements.* (Not open to students who have credit for Bot. 1 and Zool. 48.)

(2) AS. MAN AND THE LIVING WORLD. An experimental "advanced standing" section of biology will be available during the first semester to a group of freshmen and sophomores who have had good background in high school biology and elementary physical sciences. During orientation week a pre-test covering these areas will be given to those students who wish to enroll with advanced standing. Admission to this section will have the effect of waiving three hours of the six credit hours required in the biological sciences. Students completing this course in the first semester and who wish to take further work in the biological sciences may elect one of several courses in the second semester. Further information concerning admission to this section can be obtained by contacting Professor George M. Moore, Nesmith 101.

61-62. CLINICAL LABORATORY METHODS. This is an 11-month course in medical technology taken at the Mary Hitchcock Memorial Hospital School of Medical Technology, Hanover, New Hampshire. The course starts about June 20, and includes lectures and laboratory work in bacteriology, blood bank and serology, clinical chemistry, hematology, laboratory management and ethics, mycology, parasitology, histology, and clinical microscopy. Credits will be allowed when the University has received a transcript of the candidate's record and upon certification by the Director of the School and the Supervisor of the Medical Technology curriculum that the work has been successfully completed. This course qualifies a candidate for the examination for the Medical Technologist's Certificate administered by the Registry of Medical Technologists of the American Society of Clinical Pathologists. 16 cr. *This course cannot be taken for graduate credit.*

71-72. Principles of Ecology. The study of the interrelationships of plants and animals with both their living and non-living environments. Attention will be given to the dynamic interplay of forces in terrestrial, freshwater, and marine habitats. Consideration will be given to energy relationships, limiting factors, community organization, succession, and biogeography. Laboratory work will be selected to aid development of useful techniques, such as censusing, mapping, statistics, and environmental measurements. Mr. Swan, Mr. Reed, Mr. Sawyer. Prereq.: Bot. 6, 56, and one of the following: Zool. 55, 56, or 77. 2 rec.; 2 lab.; 4 cr.

Biology-Education (Biol.-Ed.) 91. Problems in the Teaching of High-School Biology. Objectives and methods of teaching. The selection and organization of materials; the preparation of visual aids; the setting up of aquaria and other projects. The use of the field trip as a tool in teaching high-school biology. Mr. Schaefer. Prereq.: Two years of biological science and Educ. 58 with a grade of C or better. (See page 164.) 2 rec.; 1 lab.; or field trip; 3 cr.

Education-Biology (Ed-Biol.) 93, 94, Supervised Teaching in High-School Biology. (See page 165.)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

BOTANY

Albion R. Hodgdon, *Professor;* M. C. Richards, *Professor;* Avery E. Rich, *Professor;* J. F. Reed, *Professor;* Stuart Dunn, *Associate Professor;* Charlotte G. Nast, *Associate Professor;* Marion E. Mills, *Assistant Professor Emerita;* Richard Schreiber, *Assistant Professor*

1. General Botany. The principal plant groups with emphasis on structure, function, and economic importance, stressing agricultural applications. Not open to students who have had Biol. 1-2. Mr. Schreiber. Required of freshmen in Agriculture. 2 lec.; 2 lab.; 4 cr.

2. General Botany. A general survey of the entire plant kingdom with emphasis on development, reproduction, and evolutionary trends. Mr. Schreiber Prereq.: Bot. 1. 2 lec.; 2 lab.; 4 cr.

3. The Plant World. The structure and function of plant parts. The application of basic biological principles to plant life. Students who have had Bot. 1 should not elect this course. Miss Nast. Prereq.: Biol. 1-2. 3 lec.; 1 lab.; 4 cr.

6. Systematic Botany. The identification and classification of our native trees, shrubs, and wild flowers. Mr. Hodgdon. Prereq.: Biol. 1-2 or Bot. 1. 1 lec.; 2 lab.; 3 cr.

12. Morphology of the Vascular Plants. A study of the life histories of the Pteridophytes, Gymnosperms and Angiosperms, including comparisons of general structure and sexual organs. Miss Nast. Prereq.: Bot. 2 or Bot. 3. 2 lec.; 2 lab.; 4 cr. (Alternate years; offered 1958-1959.)

42. Plant Ecology. Plant life and its environment, including a consideration of the principal environment factors, such as light, temperature, soil, water, and biotic relations; study of associations, successions, and plant forms; a survey of plant distribution and underlying causes. Mr. Reed. Prereq.:

51. Plant Pathology. The nature of disease in plants, the etiology, symptomatology, and classification of plant diseases. Mr. Rich. Prereq.: Bot. 1 or Bot. 3. 1 lec.; 2 lab.; 3 cr.

52. Principles of Plant Disease Control. Exclusion eradication, protection, and immunization, and the specific, practical methods used to control plant diseases. Mr. Rich. Prereq.: Bot. 51. 1 lec.; 2 lab.; 3 cr. (Alternate years; not offered in 1958-1959.)

53. Plant Anatomy. The anatomy of vascular plants with special emphasis upon tissue development and structure. Miss Nast. Prereq.: Bot. 1 or Bot. 3. 1 lec.; 2 lab.; 3 cr.

54. Cytology. The structure, physiological behavior, and development of cells. The cellular basis of heredity. Mr. Schreiber. 2 lec.; 1 lab.; 3 cr.

55. Advanced Systematic Botany. The principles and laws of plant classification and nomenclature: study of plant families, field and herbarium work. Mr. Hodgdon. Prereq.: Bot. 6. Hours to be arranged. 4 cr.

56. Plant Physiology. Structure and properties of cells, tissues and organs; absorption and movement of water; metabolism; growth and irritability. Mr. Dunn. Prereq.: Bot. 1 or Bot. 3, and one year of chemistry. 2 lec.; 2 lab.; 4 cr.

57, 58. Investigations in (a) Systematic Botany, (b) Plant Physiology, (c) Plant Pathology, (d) Plant Anatomy, Morphology, and Cytology, (e) Plant Ecology, (f) Aquatic Plants, and (g) Cytology. Elective only upon consultation with Chairman of Department. Mr. Hodgdon, Mr. Dunn, Mr. Rich, Miss Nast, Mr. Reed, and Mr. Schreiber. Hours to be arranged. 2 to 6 credits.

59, 60. Botany Seminar. Library and reference work and the preparation of papers and abstracts on special phases of botany. Practice in the preparation of oral and written reports. Botany staff. Prereq.: Six hours of botany or permission of the Chairman of the Department. 1 rec.; 1 cr.

BUSINESS ADMINISTRATION

(*See Economics and Business Administration*)

CHEMICAL ENGINEERING

Oswald T. Zimmerman, *Professor;* Irvin Lavine, *Professor*

41. Process Engineering Principles. A study of chemical processes from the point of view of energy and material balances. The laboratory work involves a study of fuels and combustion, and the testing of fuels and related materials. Mr. Lavine. 3 lec.; 2 lab.; 5 cr.

51. Chemical Engineering Principles I. A study of units and dimensional analysis; material and energy balances; gaseous, solid, and liquid fuels; combustion; introduction to fluid flow and heat transfer. Laboratory work includes experiments in the use of various types of temperature measuring devices and flow meters; gas analysis; calorimetry; and heat transfer. Mr. Lavine. 3 lec. or rec.; 1 lab.; 4 cr. (Not offered 1958-1959.)

52. Chemical Engineering Principles II. The study of a number of selected processes from the points of view of thermodynamics, kinetics, catalysis, instrumentation, materials handling and materials of construction; and an introduction to costs. Processes studied include petroleum refining, ammonia synthesis, chlorine-caustic production and the manufacture of sulfuric, nitric, and hydrochloric acids, and soda ash. Laboratory work includes experiments in the use of various types of apparatus for measuring the viscosity and other properties of petroleum products; measurements of the rates of chemical reactions; and experiments in size reduction and separation, and fluidization. Mr. Lavine. 3 lec. rec.; 1 lab.; 4 cr. (Not offered 1958-1959.)

54. Chemical Engineering Principles III. The theories and applications of fluid mechanics, heat transfer, evaporation, crystallization, filtration, humidity and air conditioning, and drying. Mr. Zimmerman. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

61. Metallography. (See Ch. E. 68.)

63. Chemical Engineering Principles IV. The theories and applications of the chemical engineering diffusional operations. Subject matter covered includes mass transfer, simultaneous mass and heat transfer, gas and liquid diffusion, gas absorption, distillation, liquid-liquid extraction, and solid-liquid extraction. Mr. Zimmerman. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

65. Chemical Engineering Laboratory. A laboratory study, using typical chemical engineering equipment, of fluid flow, heat transfer, evaporation, distillation, humidification, drying, filtration, gas absorption, liquid-liquid extraction and solid-liquid extraction. Mr. Lavine. 2 lab.; 2 cr. (Not offered 1958-1959.)

66. Chemical Engineering Economics and Plant Design. The principles of cost engineering, including estimation of plant investment, working capital, operating costs, labor requirements, payout time, and profitability. Subject matter covered includes value of money, capitalized costs, simple and compound interest, depreciation, taxes and insurance, labor requirements, overhead, financing of chemical enterprises, design of equipment and plants for minimum cost, plant location, transportation, sales cost, equipment cost, and cost indexes. Each class selects one or more problems involving the complete design of a chemical plant. For each problem, the most desirable process must be determined, the site selected, the equipment and plant designed, calculations made for all costs, profitability and payout time, and a complete report prepared, including the drawings of equipment and plant layout. Mr. Lavine. 1 lec. or rec.; 3 lab.; 4 cr. (Not offered 1958-1959.)

67. Chemical Engineering Thermodynamics. A study of the fundamental laws of energy and their application to chemical engineering problems. Mr. Zimmerman. 3 lec. or rec.; 3 cr. (Available 1958-1959 as Ch.E. 79.)

68. Metallography. A study of the composition and properties of metals and alloys, based principally on the electron theory of solids. Among the subjects covered are crystallography, including X-ray crystallography, and the effects of mechanical and thermal treatment on the properties of metals and alloys, the preparation and microscopic examination of polished sections, and X-ray diffraction measurements. Mr. Schneer. 2 lec. or rec.; 1 lab.; 3 cr. (Available 1958-1959 as Ch.E. 61.)

69. Chemical Engineering Project. In this course, each student selects a research problem which he carries out independently under faculty super-

vision. Intensive study in both the library and the laboratory and a satisfactory report upon completion of the work are required. Mr. Zimmerman. 3 lab.; 3 cr. (Not offered 1958-1959.)

71-72. Unit Processes. The important inorganic and organic industrial chemical processes from the point of view of the basic chemical reactions and physical operations involved. Mr. Lavine. 2 lec.; 2 cr.

74-75. Unit Operations. The theory and practice of the fundamental chemical engineering unit operations, including flow of liquids, flow of heat, evaporation, distillation, drying, filtration, gas absorption, extraction, humidification and air conditioning, crystallization, crushing and grinding, and size separation. Mr. Zimmerman. 3 lec.; 3 cr.

76. Chemical Engineering Economics. The economic factors involved in industrial chemical processes and the application of economic balances to the design and selection of chemical engineering equipment. Mr. Zimmerman. 3 lec.; 3 cr.

77. Unit Operations Laboratory. Experiments based upon the unit operations are performed on typical chemical engineering equipment. Mr. Lavine 3 lab.; 3 cr.

78. Chemical Plant Design. The design and layout of chemical plants and equipment. The assigned problems are of a practical nature, such as the manufacture of some chemical product, and their solution will include the design or selection of all equipment and drawings of equipment, plant, and layout. Mr. Lavine. 3 lab.; 3 cr.

79. Chemical Engineering Thermodynamics. A study of the fundamental laws of energy and their application to chemical engineering problems. Mr. Zimmerman. 2 lec.; 1 rec.; 3 cr.

80. Chemical Engineering Project. Each student selects a research problem which he carries out independently under faculty supervision. Intensive study in both the library and the laboratory and a satisfactory thesis at the completion of the work are required. Mr. Zimmerman. 5 lab.; 5 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

CHEMISTRY

Harold A. Iddles, *Professor;* Albert F. Daggett, *Professor;* James A. Funkhouser, *Professor;* Helmut M. Haendler, *Professor;* Henry G. Kuivila, *Professor;* Robert E. Lyle, Jr., *Professor;* Charles M. Wheeler, Jr., *Associate Professor;* Alexander R. Amell, *Assistant Professor;* Paul R. Jones, *Assistant Professor;* Albert K. Sawyer, *Assistant Professor;* Frank L. Pilar, *Assistant Professor;* Gloria G. Lyle, *Instructor;* Anthony E. Petrarca, *Instructor*

1-2. General Chemistry. A broad course in elementary chemistry with many lecture demonstrations and some laboratory practice. Topics of interest to the professional student and of general interest are presented. For Agriculture and Home Economics students and as an elective. Mr. Sawyer, Mrs. Lyle, and assistants. 3 lec.; 1 lab.; 4 cr.

3-4. General Chemistry. The fundamental laws and conceptions of chemistry, including a study of the nonmetals and metals and their compounds.

The theoretical principles are illustrated by many lecture demonstrations, and the applications of chemistry in the professions are explained. Mr. Funkhouser, Mr. Sawyer, Mr. Petrarca, Mr. Pilar, and assistants. For students who plan to take further courses in the Department of Chemistry. 2 lec.; 1 rec.; 1 lab.; 4 cr.

5-6. Inorganic Chemistry. A study of general inorganic chemistry, including qualitative analysis. The preparation of secondary school chemistry will furnish a basis for a thorough course for Chemistry majors and others who may elect the course. Mr. Iddles and Assistants. 3 lec.; 1 rec.; 2 lab.; 6 cr.

17. Quantitative Analysis. An elementary course in quantitative analysis designed for those students desiring a brief terminal course in analytical chemistry. Mr. Amell and assistants. Prereq.: Chem. 4. 2 lec.; 2 lab.; 4 cr.

21. Semimicro Qualitative Analysis. The fundamental theories of solutions as applied to the reactions of qualitative analysis. Problem work is required. The laboratory work uses the semimicro technique and provides ample experience in the analysis of simple and complex mixtures. Mr. Haendler and assistants. Prereq.: Chem. 4. 2 lec.; 2 lab.; 4 cr.

22. Quantitative Analysis. The theory and laboratory technique of the more common determinations of gravimetric and volumetric analysis. Emphasis on the solution of problems. A comprehensive study of the more common analytical methods. Mr. Amell and assistants. Prereq.: Chem. 21. 2 lec.; 3 lab.; 5 cr.

31. Technical Quantitative Analysis. The lectures and laboratories are concerned with the principles and practice of technical methods of analysis. As a part of the lecture work the principles of industrial stoichiometry, including the calculation of material and energy balances, are developed. In the laboratory work the following analytical problems are considered: the analysis of complex materials, such as limestone and ferrous and non-ferrous alloys; electroanalysis; organic reagents as precipitants; techniques of gas analysis; potentiometric titrations, and colorimetry. Mr. Amell and assistant. Prereq.: Chem. 22. 3 lec.; 2 lab.; 5 cr.

45, (45). Organic Chemistry. An introductory but comprehensive study of the chemistry of carbon compounds with emphasis on the particular phases of the subject needed by students preparing to be technicians, nurses, majors in biological sciences, and others, where a brief course is desired. Mr. Kuivila Mr. Lyle, and Mr. Jones. Prereq.: Chem. 3-4. (Elective for Medical Technology, Nursing, and Pre-Dental students, and majors in Botany.) 3 lec.; 2 lab.; 5 cr.

47-48. Organic Chemistry. Lectures on the principal classes of organic compounds, aliphatic and aromatic, with emphasis on class reactions and structural theory. Laboratory exercises in the preparation and purification of selected organic compounds; also the use of group reactions for the identification of organic substances in a systematic scheme of qualitative organic analysis. Mr. Iddles, Mr. Jones, and assistants. Prereq.: Qualitative Analysis. 3 lec.; 2 lab.; 5 cr.

51-52. Organic Chemistry. Lectures on the principal classes of organic compounds, aliphatic and aromatic, with emphasis on class reactions and structural theory. Laboratory exercises in the preparation and purification of selected organic compounds. Mr. Funkhouser and assistants. Prereq.: junior standing; Chem. 21. 3 lec.; 2 lab.; 5 cr.

55-56. STRUCTURAL AND THEORETICAL PROBLEMS OF MODERN ORGANIC CHEMISTRY. An intensive study of the methods of preparation and reactions of the principal classes of organic compounds. The electron theory of organic chemistry is used to correlate these reactions. The variation in reactivity of these various classes of organic compounds is utilized as a method of characterization of organic compounds. Emphasis is on the solution of assigned problems. Mr. Lyle. Prereq.: One year of Organic Chemistry. 3 lec., 1st semester; 1 lec. and 2 labs., 2nd semester; 3 cr.

62. INSTRUMENTAL ANALYSIS. The theory and technique of the recently developed physico-chemical methods of analysis. Electrometric experiments include potentiometric. conductometric, and amperometric titrations. The field of absorption spectroscopy is typified by the use of grating-type spectrometers to cover the near ultraviolet and visible regions of the spectrum. Qualitative and quantitative determinations in the field of emission spectroscopy are made using both prism and grating instruments. Emulsion calibration is especially stressed. Mr. Amell. Prereq.: Elementary Quantitative Analysis. 2 lec.; 2 lab.; reports; 5 cr.

82. INTRODUCTORY PHYSICAL CHEMISTRY. Kinetic theory of gases; quantitative laws for behavior of matter in the gas, liquid, and solid phases; valence and the chemical bond; radioactivity; atomic structure and valence; laws of solutions; homogenous and heterogenous equilibrium; colloids; electrochemistry. Designed for Pre-Medical and Biology students. Mr. Wheeler. Prereq.: Chem. 17-21, Phys. 2. Elementary Mathematics. 3 lec.; 1 lab.; 4 cr.

83-84. ELEMENTARY PHYSICAL CHEMISTRY. The properties of gases, liquids, and solids; thermochemistry and thermodynamics; solutions. chemical equilibria reaction rates, conductance, and electromotive force. Mr. Wheeler. Prereq.: Analytical Chemistry, Math. 10 or 23. and Physics. 3 lec.; 2 lab.; 5 cr.

85. INORGANIC CHEMISTRY. A brief discussion of selected topics fundamental to the theoretical and practical aspects of inorganic chemistry, to include atomic structure and classification of the elements, chemical linkage, crystal chemistry, interatomic distances, metallic elements, and crystallization. This is to be followed by consideration of the relationships between various compounds based upon these principles, with emphasis on periodic group similarities. Mr. Haendler. Prereq.: Chem. 83-84. 3 lec.; 3 cr.

86. ADVANCED PHYSICAL CHEMISTRY. A review of selected topics in elementary physical chemistry. Mr. Amell. Prereq.: One year of Physical Chemistry. 3 lec.; 3 cr.

87, 88. CHEMICAL LITERATURE AND SEMINAR. Use of the Chemical Library; student reports on topics of interest. Mr. Lyle, Mr. Wheeler, and Mr. Kuivila. Prereq.: Chem. 48 or 52 and 84. 1 lec.; 1 cr.

89-90. THESIS. A thesis covering the related background and experimental observation of the year's investigation in some selected subject is required. Members of the staff. For seniors in Chemistry who have completed Chem. 48, 62, 84, and have a grade point average above 2.5. 5 lab.; 6 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

DESCRIPTION OF COURSES

CIVIL ENGINEERING

EDMOND W. BOWLER, *Professor;* RUSSELL R. SKELTON, *Professor;* CHARLES O. DAWSON, *Professor;* EDWIN S. ALLING, *Associate Professor;* NORMAN G. LECLERC, *Instructor*

1. SURVEYING. Theories on which engineering measurements are based and principles involved in making such measurements with tape, transit, level, and stadia; and in computing, adjusting, and plotting such measurements for area and mapping purposes. Prereq.: Math. 21. 2 rec.; 1 lab.; 3 cr. (Not offered 1958-1959.)

2. SURVEYING. An introduction to photogrammetry, including photo interpretation, topographic and planimetric mapping from air photos, use of aerial surveys for engineering purposes. Railway and highway curves. Prereq.: Math 21. 1 rec.; 2 labs.; 3 cr. (Not offered 1958-1959.)

3-4. SURVEYING. Theory and use of surveying instruments and methods on plane, photogrammetric, and topographic surveys. Railway and highway curves. A topographic survey of a small area is made in the field by the transit and stadia method and the map is plotted in the drafting room. Theory and use of the plane table. Introduction to photogrammetry, including photo interpretation, topographic, and planimetric mapping from air photos, use of aerial surveys for engineering purposes. Mr. Alling, Mr. Leclerc. Prereq.: Math. 13. C.E. 3: 3 rec.; 3 lab.: 6 cr. C.E. 4: 1 rec.; 2 lab.; 3 cr.

5. SURVEYING. Applications of theories and principles studied in Surveying 1. Horizontal and vertical control of maps. Observations on the sun and polaris. Laying out engineering structures. Cadastral surveys. Theory and use of the plane table. Drafting room practice in map making. Theory and use of the current meter for stream measurements. Prereq.: Surveying 1. 2 rec.; 1 lab.; 3 cr. (Not offered 1958-1959.)

6. ROUTE SURVEYING. Theory and practice relating to preliminary and final location surveys for highways. railways, and pipe lines. Theory and problems in earthwork, the mass diagram, grade lines, vertical curves, cross sectioning, and slope stakes. Mr. Skelton. Prereq.: C.E. 4 either concurrently or as a prerequisite. 1 rec.; 2 lab.; 3 cr.

7, (7). SURVEYING. The theory and use of tape, level, transit, plane table, and stadia in making plane and topographic surveys. Computations and drafting exercises necessary for making surveys and maps for all purposes. Mr. Dawson, Mr. Leclerc. 2 rec.; 1 lab.; 3 cr.

15. ENGINEERING MATERIALS. Methods of manufacture, physical properties, and the application of the various materials used in engineering works, including timber, steel, stone, brick, cement, concrete, and bituminous materials. Laboratory tests and reports on the testing of cements, aggregates, and concrete specimens. Mr. Skelton. Prereq.: M.E. 9 either concurrently or as a prerequisite. 2 rec.; 1 lab.; 3 cr.

22. FLUID MECHANICS. Properties of fluids; statics of fluids; theorems and criteria of fluid motion; fluid flow through orifices, tubes, nozzles and pipes; flow over weirs, flow in open channels; dynamics of fluids in motion. Laboratory exercises. Mr. Dawson. Prereq.: M.E. 9 and Math. 18. 3 rec.: 1 lab.; 4 cr.

23, (23). FLUID MECHANICS. Properties of fluids; statics of fluids; theorems and criteria of fluid motion; fluid flow through orifices, tubes, nozzles and pipes; flow over weirs; flow in open channels; dynamics of fluids in motion. Mr. Dawson. Prereq.: M.E. 9 and Math. 18. 3 rec.; 3 cr.

25. Theory of Determinate Structures. The stress analysis of structures under fixed and moving loads. Roof trusses, highway, and railroad bridges; use of influence lines, lateral bracing, and portals. Mr. Alling. Prereq.: M.E. 25. 3 rec.; 1 lab.; 4 cr. (Not offered 1958-1959.)

26. Steel Design. The design of members and connections; tension and compression members, beams, plate girders; riveted, bolted, and welded joints. Mr. Alling. Prereq.: C.E. 25 and M.E. 35. 2 rec.; 1 lab.; 3 cr. (Not offered 1958-1959.)

27. Theory of Determinate Structures. The stress analysis of structures under fixed and moving loads. Roof trusses, highway and railroad bridges; use of influence lines, lateral bracing, and portals. Mr. Alling. Prereq.: M.E. 9 as prerequisite or concurrently. 3 rec.; 1 lab.; 4 cr.

28. Theory of Indeterminate Structures. Beam and truss deflections. The analysis of continuous beams and rigid frames by classical and modern methods; indeterminate trusses. Mr. Alling. Prereq.: C.E. 27, M.E. 10, Math. 18, as prerequisites or concurrently. 3 rec.; 3 cr.

29. Theory of Indeterminate Structures. Beam and truss deflections. The analysis of continuous beams and rigid frames by classical and modern methods; indeterminate trusses. Mr. Alling. Prereq.: C.E. 26. 3 rec.; 3 cr. (Not offered 1958-1959.)

31. Community Planning. An introduction to the subject of community planning. Social, economic, and physical factors affecting community planning; content and extent of desirable community planning programs, including purpose and scope, the preliminary survey, elements of community land planning, the master plan, transportation systems, street patterns and traffic, motor vehicle parking, airport sites, public building sites, parks and recreational facilities, zoning, control of land sub-division, neighborhood centers, housing, legal, financial and economic problems, and redevelopment of blighted areas. Elective for juniors and seniors by permission of the instructor. Mr. Dawson. 3 lec. or rec.; 3 cr.

33-34. Hydraulic and Sanitary Engineering. Precipitation, water losses, run-off, drainage areas, stream flow, water power estimates, hydraulic turbines, dams and waterways; the sources, quantity, quality, and sanitary aspects of public water supplies; the methods of purification and distributing systems; the theory and problems of sewerage, the principles governing the disposal of sewage, and the various methods of sewage treatment. Mr. Bowler. Prereq.: C.E. 22. C.E. 33: 3 rec.; 1 lab.; 4 cr. C.E. 34: 3 rec.; 2 lab.; 5 cr.

35. Steel Design. The design of members and connections; tension and compression members, beams, plate girders; riveted, bolted, and welded joints. Mr. Alling. Prereq.: C.E. 28. 2 rec.; 1 lab.; 3 cr.

37. Reinforced Concrete Design. The principles of reinforced concrete, including rectangular beams, slabs, T-beams, columns, footings, retaining walls. Mr. Alling. Prereq.: C.E. 28 or 26. 2 rec.; 1 lab.; 3 cr.

38. Structural Engineering. The planning and design of determinate and indeterminate structures. Introduction to modern design theories: prestressed concrete, plastic theory of steel and reinforced concrete members and frames. Mr. Alling. Prereq.: C.E. 35 or 29, and 37. 2 rec.; 1 lab.; 3 cr.

39. Highway Engineering. The economics of location and design of highways and city streets; methods of construction, maintenance, and specifications governing the various types of surface. The administration and methods of financing of highway systems. Selected problems of location and design are studied in the laboratory. Mr. Skelton. Prereq.: C.E. 6 and 15. 2 rec.; 2 lab.; 4 cr.

40. Soil Mechanics and Foundations. The principles underlying the behavior of various soils when subjected to structural loads. Problems and methods encountered in foundation design and construction, building codes and legal aspects of foundation construction, also test borings and other underground exploration methods. Mr. Skelton. Prereq.: C.E. 35. 2 lec.; 1 lab.; 3 cr.

41, 42, 43, 44. Student Chapter of the American Society of Civil Engineers. Junior and senior students in Civil Engineering are required to join the student chapter of the American Society of Civil Engineers. In addition to its ordinary life under the guidance of student officers, the chapter meets once a week under the direction of an instructor, when prepared addresses by the student members are presented. Mr. Dawson. ½ cr. Students passing this course will receive a grade of Cr.

DAIRY SCIENCE

Kenneth S. Morrow, *Professor;* Harry A. Keener, *Professor;* Nicholas F. Colovos, *Associate Professor;* Herbert C. Moore, *Associate Professor*

5. Fundamentals of Dairying. A general survey of the dairy industry; the selection, feeding, and management of dairy cattle; the composition and properties of milk and other dairy products; dairy manufacturing processes; market milk. Mr. Morrow and Mr. Moore. 2 lec.; 1 lab.; 3 cr.

30. Dairy Bacteriology. The application of bacteriology principles to the production and processing of milk and other dairy products. Mr. Moore. 2 lec.; 2 lab.; 4 cr.

33. Dairy Products Judging. The various standards and grades of dairy products, with practice in judging milk, butter, cheese, and ice cream. Mr. Moore. 1 lab.; 1 cr.

34. Dairy Cattle Judging. Comparative judging of dairy cattle using animals in the University herd and in nearby herds. Mr. Morrow. 1 lab.; 1 cr.

36. Advanced Dairy Cattle Judging. Continuation of Dairy Science 34. Emphasis on training for participating on dairy cattle judging teams. Mr. Morrow. Prereq.: D. S. 34. 1 lab.; 1 cr.

60. Dairy Seminar. A study of the literature covering recent research in the various phases of dairying. Students are required to prepare and present papers on selected topics. Dairy Science staff. 2 lec.; 2 cr.

62. Advanced Dairy Science. Basic data, fundamental observations, and discussions of research contributing to the present status of the dairy industry. Mr. Moore. 2 lec.; 2 cr.

63. Dairy Cattle. Purebred dairy cattle, breed history, pedigrees; family lines and methods of outstanding breeders; the application of the principles of genetics to the improvement of dairy cattle herd analysis. Mr. Morrow. 2 lec.; 1 lab.; 3 cr.

64. Milk Production. Feeding and management of dairy animals; calf feeding; raising young stock; feeding for economical milk production. Mr. Keener. 2 lec.; 1 lab.; 3 cr.

65. Market Milk. The producing, handling, and distribution of market and certified milk; dairy farm inspection; control of milk supply. Mr. Moore. 2 lec.; 1 lab.; 3 cr.

66. Ice Cream, Butter, and Cheese. The making, handling, and marketing of ice cream, butter, and cheese. Mr. Moore. 2 lec.; 1 lab.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

ECONOMICS AND BUSINESS ADMINISTRATION

Arthur W. Johnson, *Professor;* Joseph E. Shafer, *Professor;* Carroll M. Degler, *Professor;* John A. Hogan, *Professor;* Ruth J. Woodruff, *Professor;* Doris E. Tyrrell, *Associate Professor;* John D. Hauslein*, *Associate Professor;* Sam Rosen, *Associate Professor;* Myra L. Davis, *Assistant Professor;* Richard L. Small, *Assistant Professor;* James F. Cronin, Jr., *Assistant Professor;* Wynne B. Bascom, *Instructor*

Business Administration

Note — Students who have completed two or more years of bookkeeping in preparatory school will be permitted to register for B.A. 3-4, *Intermediate Accounting*, upon passing, without academic credit, an examination covering the material of B.A. 1-2.

Register for the following courses as B.A. 1, etc.

1-2. Principles of Accounting. The fundamentals of accounting. Theory of debit and credit; functions and classification of accounts; modern accounting records including special and columnar books. Adjusting entries, work sheets, and financial statements. Single proprietorship, partnerships, and an introduction to corporations. Mr. Bascom. 3 lec. or rec.; 3 cr.

3-4. Intermediate Accounting. Comprehensive study of corporation accounting principles and objectives of valuation, consignments, installment selling, depreciation and depletion, funds and reserves, application of funds, and analysis of financial statements. Mr. Johnson. Prereq.: B.A. 2. 3 lec. or rec.; 3 cr.

7-8. Cost Accounting. The relation of cost accounting to general accounting. The place of cost accounting in modern business. Types of cost systems and their application to particular lines of business. Careful analysis of methods of computing costs. Principles of cost control. Mr. Johnson. Prereq.: B.A. 2. 3 lec. or rec.; 3 cr.

9-10. Hotel Accounting. Theory and practice of keeping accounts and financial records for hotels. Prereq.: B.A. 1-2. 2 lec.; 1 lab.; 3 cr.

21-22. Commercial Law. The law of contracts, agency, sales, negotiable instruments, partnerships, and corporations. Mr. Small. *Open to juniors and seniors.* 3 lec. or rec.; 3 cr.

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*Deceased January 19, 1958.

23, (23). BUSINESS COMMUNICATION. Report writing, including preparation of charts, forms, and graphs. Methods of intra-office, inter-office, and inter-business communication. Preparation of instruction data for employees, minutes of meetings, and manuals of company practices and procedures. Business letters of various types. Mr. Schultz. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

24. INTRODUCTION TO BUSINESS. An orientation toward the more advanced courses in business administration or a one-semester terminal course for non-majors. Outline of the major fields and problems of business administration: production, distribution, finance, and control. Business in relation to the economy as a whole. Mr. Cronin. *Open only to freshmen and sophomores.* 3 lec. or rec.; 3 cr.

34. BUSINESS MANAGEMENT. Fundamental principles and techniques of successful organization, management, and operation of business activities, including a study of the qualifications, functions, and activities of the executive. Mr. Small. *Open to juniors and seniors.* 3 lec. or rec.; 3 cr.

45. PRINCIPLES OF SELLING. Principles and methods used by commercial and industrial concerns in selling to the ultimate consumer, middle man, and other businesses. Consideration of principles employed in personal selling in national sales organizations, manufacturers, producers, and in retail establishments. Mr. Small. *Open to juniors and seniors.* 3 lec. or rec.; 3 cr.

46. PRINCIPLES OF RETAILING. Methods and principles of operating chain, department, specialty, and unit stores. Consideration of retail location, store layout and merchandise classification, sales and service policies, pricing, buying, and organization. Mr. Cronin. Prereq.: Econ. 25. 3 lec. or rec.; 3 cr.

47. PRINCIPLES OF ADVERTISING. Advertising as an element of marketing strategy for the firm. Management considerations involved in the selection of the appropriate form of advertising. Campaign planning, media selection, and effectiveness testing. Mr. Cronin. Prereq.: Econ. 25. 3 lec. or rec.; 3 cr.

48. SALES MANAGEMENT. Principles of successful sales management, their application, merchandising, sales promotion, building a sales organization; advertising's place in sales management; sales policies, costs, and controls; selection, development, and training of sales staffs. Mr. Small. *Open to juniors and seniors.* 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

52. MARKET ANALYSIS AND RESEARCH. The nature, procedures, and applications of market research; probability and non-probability sample design; significance tests. Mr. Cronin. Prereq.: Econ. 25. 3 lec. or rec.; 3 cr.

55. ADVANCED ACCOUNTING. Advanced theory of accounting, corporate consolidations, insolvencies, realization and liquidation problems, estate accounting. Mr. Johnson. Prereq.: B.A. 4 or equivalent. 3 lec. or rec.; 3 cr.

56. FEDERAL TAX ACCOUNTING. The federal income tax laws and accounting procedure in connection therewith; social security taxes, estate, and gift taxes. Mr. Johnson. Prereq.: B.A. 4, or permission of the instructor. 3 lec. or rec.; 3 cr.

57. AUDITING. Study of procedure and practice in the verification of records, analysis of accounts, and the presentation of conclusions. Attention is given to the responsibilities of the auditor and the procedure and practice of preparing reports. Mr. Johnson. Prereq.: B.A. 4 or equivalent. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

61. Analysis of Financial Statements. Analysis and interpretation of accounting data as presented in corporate balance sheets and operating statements, for the use of management in controlling its business. Comparative analysis, uses and limitations of trends and ratios, internal and external factors in analysis of both operating and financial statements. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

68. Personnel Administration. A study of methods, techniques, and psychology employed in personnel administration from the standpoint of the executive. The case study method is used. Mr. Hogan. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

70. General Insurance. The field of insurance; social value; physical and moral hazards; risk, its nature and economic significance; reinsurance; types of insurance coverage; fire, casualty, life, social; fidelity and surety bonds. Mr. Johnson. 3 lec. or rec.; 3 cr.

Secretarial Studies

Register for the following courses as Secl. 1, etc.

1-2. Shorthand. Principles of Gregg shorthand with practice in transcribing from shorthand plates and class notes. Secl. 7-8 must either be taken in conjunction with this course or precede it. Miss Tyrrell. Prereq.: Permission of instructor. 5 rec.; 3 cr.

3-4. Advanced Shorthand. A review of fundamental principles, the building of shorthand vocabulary, practice in taking dictation at increasing rates of speed, and practice in developing skill and speed in transcription. Miss Tyrrell. Prereq.: Secl. 2 or equivalent and permission of instructor. 5 rec.; 3 cr.

5, (5). Personal Use Typewriting. Practice in acquiring correct typing techniques, arranging letters, outlines, notes, themes, bibliographies, and simple tabulations. Open to any student who does not know how to typewrite. Miss Davis. Prereq.: Permission of instructor. 5 lab.; 1 cr.

7-8. Typewriting. Practice in acquiring correct typewriting techniques, and in arranging letters, tabulations, and simple manuscripts. Miss Davis. Prereq.: Permission of instructor. 5 lab.; 2 cr. (*See Secl. 27.*)

9-10. Advanced Typewriting. Practice in tabulating and in writing business letters, legal papers, and various business forms. Miss Davis. Prereq.: Secl. 8 or the equivalent and permission of the instructor. 5 lab.; 2 cr.

11. Filing. Various alphabetic, numeric, geographic, and subject-matter systems of correspondence filing; cross reference; follow-up methods; filing supplies and equipment. Miss Davis. Prereq.: Secl. 7 and permission of instructor. 3 lec. or rec.; 2 cr.

(13). Office Machines. Duplicating methods; practice in typing master copies and stencils, and in operating an electric typewriter, a mimeograph, a mimeoscope, and a liquid process duplicator; practice in machine transcription; and an introduction to adding and calculating machines. Miss Davis. Prereq.: Secl. 8 and permission of instructor. 5 lab.; 2 cr.

17-18. Secretarial Office Procedure and Practice. First semester, discussion of secretarial duties and traits; problems in the discharge of various duties; and problems in office management. Second semester, 144 hours of practice secretarial work in business offices. Miss Tyrrell. This course must be taken in conjunction with Secl. 3-4 and Secl. 9-10, or following these courses and with permission of instructor. 3 rec.; 3 cr.

22. ADVANCED DICTATION. Speed building in dictation and transcription. Miss Tyrrell. Prereq.: Secl. 4 and permission of instructor. 3 rec.; 3 cr.

23-24. BUSINESS WRITING. Review of grammar, word usage, punctuation, and sentence construction. Practice in writing various types of business letters and reports; proofreading; editing. Prereq.: One semester of typewriting preceding this course or taken in conjunction with it. Miss Tyrrell. 3 lec. or rec.; 3 cr.

27. TYPEWRITING. Practice in acquiring typewriting techniques, and in arranging letters, tabulations, and simple manuscripts. This course, which begins on November 10, 1958, is to be taken instead of Secl. 7 by Secretarial students who have had Secl. 5 or the equivalent. Prereq.: Secl. 5 or equivalent and permission of instructor. Miss Davis. 5 lab.; 1 cr.

Economics

Register for the following courses as Econ. 1, etc.

1-2. PRINCIPLES OF ECONOMICS. The fundamental principles which explain the organization and operation of the economic system. Mr. Shafer, Mr. Degler, Mr. Hogan, Miss Woodruff, Mr. Rosen, Mr. Cronin, and Mr. Bascom. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

3, (3). ECONOMIC AND COMMERCIAL DEVELOPMENT OF THE UNITED STATES. Historical survey of American business and industry with emphasis on the period since 1860. Miss Woodruff. 3 lec. or rec.; 3 cr.

ECONOMIC GEOGRAPHY. (See Geog. 4.)

9. TRANSPORTATION. The economic significance of transportation. Its influence on the location of economic activity. Development, organization, and regulation of transportation agencies. Mr. Cronin. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

25. MARKETING. The distribution of goods in the United States. The marketing behavior of the firm and its consequences for the economy as a whole. Price competition, the nature and economic significance of non-price competition. The influence of technology on market structures. Mr. Cronin. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

31, (31). ECONOMICS AND BUSINESS STATISTICS. The collection, analysis, interpretation, and presentation of statistical data as applied to economic and business problems. Frequency distribution, index numbers, time series, simple correlations. Emphasis is upon the interpretation and use of statistics. Required of all students majoring in Economics and in the Business curriculums. Mr. Shafer. Prereq.: Econ. 2. 2 lec. or rec.; 1 lab.; 3 cr.

51. LABOR ECONOMICS. Historical background and present status of labor organizations and problems. Labor-management relations and collective bargaining; economics of wages and employment; case studies. Mr. Hogan. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

52. PUBLIC FINANCE. Problems and policies of expenditure, revenue and debt of federal, state, and local governments. Economic analysis and evalu-

ation of individual types of taxes as well as entire government fiscal programs; critical appraisal of recommended changes in tax systems; tax problems in the State of New Hampshire. Mr. Rosen. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

53. Money and Banking. Study of the monetary and banking system with reference to monetary standards, value of money, commercial and non-commercial banking, and structure and policy of the Federal Reserve System. Mr. Degler. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

54. Advanced Money and Banking. Advanced monetary theory and some of the more practical aspects of modern banking. Mr. Degler. Prereq.: Econ. 53 and permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

55. Corporations. Study of the forms of business organization with special emphasis on the corporate system, combination, and concentration. Mr. Degler. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

56. Corporation Finance. Study of corporate securities, methods of financing, and financial policy. Mr. Degler. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

58. Principles of Investment. The general principles of investment. The problems of investment, investment characteristics of stocks and bonds; public utility, railroad, industrial, and government securities; protection of the investor; investment banking; and related problems. Mr. Degler. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

63. International Trade and Finance. Theory of international trade, foreign exchange, balance of international payments, tariffs and protection; the economic aspects of international relations, with particular reference to recent policies. Miss Woodruff. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

64. Comparative Study of Economic Systems. An examination of socialism, communism, capitalism, and modification of these types, particularly as exemplified by leading nations. Miss Woodruff. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

66. Labor Law. Principles of labor law and legislation. Prereq.: Econ. 2 or Govt. 2. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

73. Value and Distribution. An advanced course in economic theory. Emphasis is upon theory of price and the distribution of income. Mr. Shafer. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

74. The Economics of Contemporary American Business. The nature and theory of business profits and their effect on the various segments of the economy. Mr. Shafer. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

75. National Income. The measurement, theory, and public policy applications of national income. Mr. Rosen. Prereq.: Econ. 2. 3 lec. or rec.; 3 cr.

76. Economic Fluctuations (Business Cycles). Study of recurrent movements of prosperity and depression, with emphasis upon causes and public policy applications. Mr. Rosen. Prereq.: Econ. 2 and one additional semester course in Economics or permission of the instructor. 3 lec. or rec.; 3 cr.

DESCRIPTION OF COURSES

EDUCATION

Thomas O. Marshall, *Professor;* Everett B. Sackett, *Professor;* Wayne S. Koch, *Professor;* Carleton P. Menge, *Associate Professor;* Austin L. Olney, *Extension Associate Professor;* Robert J. Doxtator, *Assistant Professor;* Harold H. Benjamin, *Assistant Professor;* Samuel I. Squires, *Instructor*

Carl Lundholm, *Professor* (Physical Education); George R. Thomas, *Professor* (Art-Education); Philip S. Barton, *Professor* (Agricultural Education); George M. Moore, *Professor* (Biology-Education); Marion C. Beckwith, *Professor* (Physical Education); Paul E. Schaefer, *Associate Dean;* Doris E. Tyrrell, *Associate Professor* (Secretarial Studies-Education); David F. Long, *Associate Professor* (History-Education); Mildred I. Turney, *Associate Professor* (Home Economics-Education); Ernest W. Olson, *Associate Professor* (Physical Education); Lewis C. Goffe, *Assistant Professor* (English-Education); Frederick J. Robinson, *Assistant Professor* (Mathematics-Education); David M. Smith, *Assistant Professor* (Music-Education); Charles H. Leighton, *Instructor* (Language-Education); Jason Boynton, Paul Farris, Anne McWeeney, Joseph Petrosky, Marco Scheer, Harold Snyder, Neal Sullivan, Iris Valley, *Consultants in Teacher Education*

Supervising Teachers 1957-1958

William Annis
Ruth Ackerman
Helen Chase
Elizabeth Colcord
Robert Cook
Helen Cronin
Harold Crossman
Robert Cummings
Philip Delehanty
Ann Donovan
Joseph Doucet
Roland Dupuis
Marian Gray
Genevra Howe
Irene Kidder
Dorothy Kingsbury
Nathan Knight
Florence Langley
Donald Maher
Charles Manos
Irene McAllister
Laura McNeil
Mary Nagle
Peter Nyren
Louise O'Brien
Jessie O'Malley
Bertha Pelleran
Edwin Preble
Gerald Quimby
George Randall
Betty Rasanen
Jacquelyn Rayno
Mary Reilly
Evelyn Rice
Claire Robertaille
Alma Sargent
George Wilson

Courses in Education

41, 42. Educational Psychology. The purpose of this course is an orientation to education in general, and teaching in particular. Through an examination of behavior in infancy, childhood, and adolescence, the student gains self-knowledge and an understanding of principles that affect all men. Special emphasis is given to the problems of learning through personal experience and analysis of the process. *(Normally one section of Education 42 also will be offered in the first semester and one section of Education 41 in the second semester.)* Mr. Benjamin, Mr. Doxator, Mr. Koch, and Mr. Menge. *Not open to freshmen.* 3 rec.; 3 cr.

(52), 52. Principles of American Secondary Education. The development and place of the secondary school in the American system of education; aims and functions of secondary education in our democracy; upward and downward extension of secondary education; articulation with lower and higher educational institutions, and with the community; the secondary-school pupil; adjustment of the work of the school to meet individual needs; the offerings, both curricular and extracurricular, of the secondary school; place and relationship of school board, superintendent, principal, and teachers. Mr. Koch and Mr. Marshall. 3 rec.; 3 cr.

58, (58). PLANNING FOR TEACHING IN HIGH SCHOOL. This course orients students to problems, principles, and techniques which are involved in planning for pupil learning in high schools. Mr. Benjamin and Mr. Doxtator. Prereq.: Education 41 and 42, required tests for teacher selection, and permission of the instructor. Education 52 advised before entering this course. 3 rec.; 1 2-hr. lab.; 4 cr.

63, (63). AUDIO-VISUAL MATERIALS IN THE ELEMENTARY AND SECONDARY SCHOOLS. A course intended to give teachers a practical working knowledge of the use of various types of audio-visual materials. Particular attention will be given to the school journey, the school museum, films, film strips, glass slides, transcriptions, recording tapes, and radio broadcasts. The course will be centered around the problems which are common to the use of audio-visual materials in both elementary and secondary schools. A laboratory period of one hour each week is required in addition to the regular class period. Efforts will be made to arrange the laboratory time to meet the needs of the students. Mr. Olney. 3 cr.

65, (65). EDUCATIONAL TESTS AND MEASUREMENTS. A basic course in the interpretation of standardized test scores. Develops bases for the analysis and evaluation of standardized tests of general achievement, intelligence, interests, personality, and specific aptitudes. Deals also with the nature and limitations of measurement as applied to education and with the purposes of measurement in the improvement of the work of the school. Special emphasis is placed on test validity and the use of test data to aid in understanding the individual pupil and his problems. Prereq.: Educational Psychology. 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

Courses in Problems in the Teaching of High-School Subjects

The following courses are devoted to a study of problems, objectives, selection and organization of subject matter, teaching and testing techniques, and classroom management in the teaching of the respective subjects. To be admitted to one of these courses the student must have completed, with a grade of at least C, Education 58† and, in addition, the courses in the subject and related subjects designated as prerequisite to the respective courses in this group. A student desiring to be considered for Supervised Teaching must complete with a grade of at least C one of these courses in the subject in which he hopes to do supervised teaching.

For details concerning prerequisites and nature of these courses, see descriptions given under respective subject matter departments.

AGRICULTURE-EDUCATION (AG-ED) 89, 90. METHODS OF TEACHING FARM MECHANICS IN VOCATIONAL AGRICULTURE. Mr. Gilman. 1 lab.; 1 cr.

AGRICULTURE-EDUCATION (AG-ED) 91, 92. PROBLEMS IN THE TEACHING OF VOCATIONAL AGRICULTURE. Mr. Barton. Open only to juniors and seniors in Agricultural Teacher Preparation. 2 lec. and 1 lab.; 3 cr.

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† Except for Ag. Ed. 89. 90, 91, 92, H. E.-Ed. 91, and P. E.-Ed. 91.

ART-EDUCATION (ART-ED) 91. PROBLEMS OF TEACHING ART IN ELEMENTARY SCHOOLS. 3 cr. Mr. Thomas.

ART-EDUCATION (ART-ED) (92). PROBLEMS OF TEACHING ART IN SECONDARY SCHOOLS. 3 cr. Mr. Thomas.

BIOLOGY-EDUCATION (BIOL-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL BIOLOGY. 3 cr. Mr. Schaefer.

ENGLISH-EDUCATION (ENGL-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL ENGLISH. 3 cr. Mr. Goffe.

GENERAL SCIENCE-EDUCATION (GS-ED) 91. PROBLEMS IN THE TEACHING OF GENERAL SCIENCE. 3 cr.

HISTORY-EDUCATION (HIST-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL HISTORY AND OTHER SOCIAL STUDIES. 3 cr. Mr. Long.

HOME ECONOMICS-EDUCATION (HE-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL HOME ECONOMICS. 3 cr. Miss Turney.

LANGUAGES-EDUCATION (LANG-ED) 91. PROBLEMS IN THE TEACHING OF MODERN LANGUAGES IN THE HIGH-SCHOOL. 3 cr. Mr. Leighton.

MATHEMATICS-EDUCATION (MATH-ED) 91. PROBLEMS IN THE TEACHING OF HIGH-SCHOOL MATHEMATICS. 3 cr. Mr. Robinson.

MUSIC-EDUCATION (MU-ED) 90. PROBLEMS IN THE TEACHING OF ELEMENTARY SCHOOL MUSIC. 3 cr. Mr. Smith.

MUSIC-EDUCATION (MU-ED) 93. PROBLEMS IN THE TEACHING OF SECONDARY SCHOOL MUSIC. 3 cr. Mr. Smith.

PHYSICAL EDUCATION-EDUCATION (PE-ED) 91. PROBLEMS IN THE TEACHING OF PHYSICAL EDUCATION FOR WOMEN. 3 cr. Miss Newman.

Courses in Supervised Teaching

This work is required in the Teacher Preparation program. It is open only to students whose applications are approved by the Chairman of the Department of Education* and the Coordinators of Student Teaching in the subject or subjects in which the applicant desires to do supervised teaching. *Applications should be filed in the office of the Department of Education on or before November 15 of the academic year in which the supervised teaching is to be done. No applications will be considered* unless the applicant has completed with a grade of at least C the following courses in Education: 41, 42, 52, and 58, and with superior grades in at least 18 semester credits in the subject matter field in which he desires to teach under supervision. The applicant must also complete with a grade of at least C a course in the problems of teaching the subject in which he desires to do supervised teaching.*

Students may be enrolled for from 6 to 14 credits of work in Supervised Teaching usually in the second semester of the academic year. Students registered in the College of Liberal Arts may count no more than 9 semester credits in Supervised Teaching toward the fulfillment of the major requirements in Education.

EDUCATION-AGRICULTURE (ED-AG) 93. SUPERVISED TEACHING IN VOCATIONAL AGRICULTURE. Prereq.: Senior standing in Agricultural Education curriculum.

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* Except Ed.-Ag. 93 and Ed.-H. E. 94.

EDUCATION-ART (ED-ART) 94. SUPERVISED TEACHING IN ART. Prereq.: ART-ED 92.

EDUCATION-BIOLOGY (ED-BIOL) 93, 94. SUPERVISED TEACHING IN HIGH-SCHOOL BIOLOGY. Prereq.: BIOL-ED 91.

EDUCATION-COMMERCE (ED-CS) 94. SUPERVISED TEACHING IN HIGH-SCHOOL COMMERCIAL SUBJECTS.

EDUCATION-ENGLISH (ED-ENGL) 94. SUPERVISED TEACHING IN HIGH-SCHOOL ENGLISH. Prereq.: ENGL-ED 91.

EDUCATION-GENERAL SCIENCE (ED-GS) 94. SUPERVISED TEACHING IN HIGH-SCHOOL GENERAL SCIENCE. Prereq.: GS-ED 91.

EDUCATION-HISTORY (ED-HIST) 94. SUPERVISED TEACHING IN HIGH-SCHOOL HISTORY AND OTHER SOCIAL STUDIES. Prereq.: HIST-ED 91.

EDUCATION-HOME ECONOMICS (ED-HE) 94. SUPERVISED TEACHING IN HIGH-SCHOOL HOME ECONOMICS. Prereq.: HE-ED 91.

EDUCATION-LANGUAGE (ED-LANG) 94. SUPERVISED TEACHING IN HIGH-SCHOOL MODERN FOREIGN LANGUAGE. Prereq.: LANG-ED 91.

EDUCATION-LATIN (ED-LAT) 94. SUPERVISED TEACHING IN HIGH-SCHOOL LATIN. Prereq.: LANG-ED 91.

EDUCATION-MATHEMATICS (ED-MATH) 94. SUPERVISED TEACHING IN HIGH-SCHOOL MATHEMATICS. Prereq.: MATH-ED 91.

EDUCATION-MUSIC (ED-MU) 93, 94. SUPERVISED TEACHING IN ELEMENTARY AND SECONDARY SCHOOL MUSIC. Prereq.: MU-ED 90, 93.

EDUCATION-PHYSICAL EDUCATION (ED-PE) (92), 92. DIRECTED TEACHING OF PHYSICAL EDUCATION FOR WOMEN. Prereq.: PE-ED 91 or concurrently. 1 lec. or rec.; 2 5-hr. lab.; 6 cr.

EDUCATION-PHYSICAL EDUCATION (ED-PE) 93, (93). DIRECTED TEACHING IN PHYSICAL EDUCATION FOR MEN. Prereq.: ZOOL. 17-18; P. E. 23 and 61. The student must have completed the methods course in the sport which he is directing or take the course concurrently. 3 cr.

ELECTRICAL ENGINEERING

ALDEN L. WINN, *Professor;* WILLIAM B. NULSEN, *Professor;* LEON W. HITCHCOCK, *Professor Emeritus;* JOHN B. HRABA, *Associate Professor;* FLETCHER A. BLANCHARD, *Associate Professor;* ALBERT D. FROST, *Associate Professor;* JOSEPH B. MURDOCH, *Assistant Professor;* DONALD W. MELVIN, *Instructor;* RONALD R. CLARK, *Instructor*

1-2. ELECTRICAL ENGINEERING. The fundamental physical laws and concepts of electrical engineering and their application to circuits, electric and magnetic fields, instrumentation, and direct current machinery. Prereq.: For 1958-1959, Math. 16; after 1958-1959, Math. 23 and Phys. 23 taken concurrently with E. E. 1. E.E. 1: 2 rec.; 1 lab. or conf.; 3 cr. E.E. 2: 3 rec.; 1 lab.; 4 cr.

3-4. APPLIED ELECTROMAGNETICS. Electric and magnetic circuits, vector diagrams, and equivalent circuits as applied to transformers, synchronous, and asynchronous machines. Prereq.: E.E. 2, Math. 21. Required of juniors in Electrical Engineering. 3 rec.; 3 cr.

5. Circuit Theory. Single phase and polyphase circuits, network theorems, and wave analysis. Prereq.: E.E. 2. Required of juniors in Electrical Engineering. 3 rec.; 3 cr.

6-7. Electronics Fundamentals. Basic principles of electronics: thermionic emission, characteristics of vacuum tubes, rectifiers and power supplies, amplifiers, modulators, detectors, oscillators, gas-tube control circuits, and the use of laboratory instruments in determining circuit performance. Prereq.: E.E. 5., E.E. 6 required of juniors in Electrical Engineering and E.E. 7 required of seniors in Electrical Engineering. E.E. 6: 3 rec.; 1 lab.; 4 cr. E.E. 7: 3 rec.; 1 lab.; 4 cr. (E.E. 6-7 replaced with E.E. 9-10 for students graduating on or after June, 1962.)

9. Physical Electronics. Electron ballistics, conduction in gases, vacuum, metals, and semiconductors; theory of emission; theory of operation, characteristic curves, and equivalent circuits for electron devices such as vacuum and gas tubes, solid state rectifiers, and transistors. Prereq.: E.E. 5 taken concurrently. Required of juniors in Electrical Engineering. 3 rec.; 3 cr. (Not offered until 1960-1961.)

10. Electronic Circuits. Theory of operation, analysis, and design of active circuits containing electron devices. Prereq.: E.E. 9. Required of juniors in Electrical Engineering. 3 rec.; 1 lab.; 4 cr. (Not offered until 1960-1961.)

15, 16, 17, 18. Student Branch AIEE-IRE. A student-conducted organization, operated under the by-laws of the institutes, designed to introduce the student to professional society activities. Approximately 10 to 12 meetings are scheduled during the year, usually in the evenings. These meetings provide lectures by industrial representatives, inspection trips, and attendance at state and regional meetings. Each student is expected to become a student member of either the AIEE or the IRE with annual dues of $5.00 per year. Required of juniors and seniors in Electrical Engineering. No credits.

23, 24. Electrical Laboratory. Experimental investigations in the principles of electrical engineering as applied to direct and alternating current machines. Laboratory procedures and presentation of engineering reports. Prereq.: E.E. 2 or E.E. 38. Required of juniors in Electrical Engineering. 1 lab.; 2 cr.

25, 26. Electrical Laboratory. Experimental investigations in the principles of electrical engineering as applied to electrical engineering systems, devices, and components. Formal reports are required. Prereq.: E.E. 4, E.E. 7 or 10. Required of seniors in Electrical Engineering. 1 lab.; 2 cr. (E.E. 26 not offered or required until 1961-1962.)

31. Circuits and Appliances. Electric circuit theory, wiring, methods, efficiency, protection of circuits and equipment, national electric code meters, motors, illumination, signal circuits, and telephones. Prereq.: Hotel Administration 26. 3 rec.; 1 lab.; 4 cr.

(33). Fundamentals of Electricity. Direct and alternating current circuits, machines, and equipment. Prereq.: Phys. 22. Required of juniors in Civil Engineering and juniors in Chemical Engineering. 3 rec.; 1 lab.; 4 cr. (Replaced by E.E. 39 for Chemical Engineering juniors who graduate on or after June, 1962.)

37-38. Electrical Machinery. Direct and alternating current circuits, theory and characteristics of electric motors and generators, starting and control equipment. Prereq.: Phys. 22. Required of juniors in Mechanical

Engineering. 3 rec.; 1 lab.; 4 cr. (Replaced by E.E. 39-41 for Mechanical Engineering juniors who graduate on or after June, 1962.)

39. ELECTRICAL ENGINEERING FUNDAMENTALS. Electric and magnetic fields and circuits. Prereq.: Physics 23. Required of seniors in Chemical Engineering and juniors in Mechanical Engineering. 3 rec.; 1 lab.; 4 cr. (Not offered until 1960-1961.)

40. ELECTRONIC FUNDAMENTALS. Physical electronics, electronic circuits with emphasis on instrumentation. Prereq.: E.E. 39. Required of juniors in Mechanical Engineering. 3 rec.; 1 lab.; 4 cr. (Not offered until 1960-1961.)

41. ELECTRICAL MACHINERY AND CONTROLS. Application of the fundamentals of electrical engineering to machines and systems. Prereq.: E.E. 39. Required of seniors in Mechanical Engineering. 2 rec.; 1 lab.; 3 cr. (Not offered until 1961-1962.)

45. TRANSMISSION LINES AND NETWORK. Transmission line fundamentals, T and Pi sections, filters, and symmetrical components. Prereq.: E.E. 5. Required of seniors in Electrical Engineering. 3 rec.; 3 cr.

46. ELECTRIC FIELDS. Static electric and magnetic fields, electromagnetic fields, Maxwell's equations, wave equations, plane waves. Prereq.: E.E. 2, Math 24. Required of seniors in Electrical Engineering. 3 rec.; 3 cr.

51-52. INDUSTRIAL ELECTRONICS FUNDAMENTALS. E.E. 51: Principles of electronics and applications to industrial control processes. E.E. 52: Study of operation and testing of selected electronic control systems. Prereq.: E.E. 33 or E.E. 38. Elective for students not registered in the Electrical Engineering curriculum. 2 rec.; 1 lab.; 3 cr. (Not offered after 1960-1961.)

58. ELECTRONIC SYSTEMS ANALYSIS AND DESIGN. A study of the principles and procedures involved in design, analysis, and testing of various electronic systems. A portion of the course is devoted to the design and construction of a simple electronic system by each student. Prereq.: Permission of instructor. 3 rec.; 1 lab.; 4 cr.

60. ADVANCED CIRCUIT THEORY. Steady state and transient analysis, derivation of fundamental formulas and constants. Prereq.: E.E. 45. Elective for seniors in Electrical Engineering. 3 rec.; 1 conference period; 4 cr. (If conference period is not offered. 3 cr.)

62. ILLUMINATION. Radiation, fundamental processes in gases, atomic spectra, sources of visible and near visible energy, lamp circuitry, lighting and wiring design, control of light, photometry, and color. Prereq.: Permission of the Instructor. 3 rec.; 3 cr.

70. (70). ELECTRICAL ENGINEERING PROJECTS. Special topics in electrical engineering. Lectures on advanced subjects in electrical engineering or special laboratory projects on design problems. Prereq.: Permission of the instructor. 1-2 rec. or lab.; 2-4 cr.

78. INDUSTRIAL ELECTRONICS. Analysis and design of the electronic components used in industrial processes; performance tests on selected electronic apparatus, such as power rectifiers, motor controls, voltage regulators, radio frequency heating equipment, resistance welding controls, etc.; introduction to feedback control systems. Prereq.: Permission of the instructor. 3 rec.: 1 lab.; 4 cr.

80. (80). ENGINEERING ANALYSIS. An intensive study of the basic principles and analytical methods employed in the solution of complex problems in the

various branches or engineering. Prereq.: Permission of the instructor. 3 rec.; 3 cr.

82. Control Systems. Fundamental principles involved in the design and analysis of feedback control systems. Prereq.: Permission of the instructor. 3 rec.; 3 cr. (Not offered until 1961-1962.)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

ENGLISH

Sylvester H. Bingham, *Professor;* William G. Hennessy, *Professor;* Carroll S. Towle, *Professor;* Edmund A. Cortez, *Professor of Speech;* Robert G. Webster, *Professor;* Lucinda P. Smith, *Associate Professor Emerita;* G. Harris Daggett, *Associate Professor;* Joseph D. Batcheller, *Associate Professor of Speech;* J. Howard Schultz, *Associate Professor;* Max S. Maynard, *Associate Professor;* Reginald Call, *Assistant Professor;* John C. Richardson, *Assistant Professor;* Lewis C. Goffe, *Assistant Professor;* Edmund G. Miller, *Assistant Professor;* Alec W. Finlayson, *Instructor;* Philip L. Nicoloff, *Instructor;* Peter L. Heyworth, *Instructor;* John F. McCarthy, *Instructor;* Joseph P. McElroy, *Instructor;* S. Anthony Caldwell, *Instructor;* Nicholas P. Nichols, *Instructor;* David G. Osborne, *Instructor;* Howard Stein, *Instructor;* Phyllis D. Williamson, *Instructor of Speech*

*A. Improvement in Writing. Required of all students whose attainments in the *fundamentals of English* are found to be unsatisfactory. Assignment to classes from which the students may be excused either at the end of the semester or at the end of the year. 3 rec.; no credit.

B. Improvement in Speech. See the section headed *Speech.*

*C. Improvement in Reading. Intensive drill in reading skills for six weeks. 3 rec.; no credit.

1-2, (2), (1). Freshman English. The training of students to write correctly and with force and to read with appreciation and discernment the chief types of literature. The staff of the department under the chairmanship of Mr. Miller. 3 rec.; 3 cr.

12. The Bible as Literature. A study of the various literary types found in the Bible and a survey of the influence of the Bible on English literature. Mr. Schultz. Prereq.: Engl. 1-2. 3 rec.; 3 cr. (Alternate years; not offered 1958-1959.)

13, 14. An Introduction to English Literature. The development of English literature from its beginnings to the 20th century by means of selected readings. Mr. Richardson, Mr. Miller, and Mr. Heyworth. Prereq.: Engl. 1-2. 3 rec.; 3 cr.

15, 16. A Survey of American Literature. Mr. Webster, Mr. Daggett, Mr. Goffe, and Mr. Nicoloff. Prereq.: Engl. 1-2. 3 rec.; 3 cr.

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* Any student may be recalled and reassigned to an instruction group at any time in his four years at college upon report of any member of the Faculty that his work in composition or in reading is deficient.

22. Writing for the Newspaper. Mr. Webster. Prereq.: Engl. 1-2. 3 rec.; 3 cr.

23, (23). Writing of Technical Reports. Mr. Webster, Mr. Heyworth, and Mr. McElroy. Required of seniors in Agriculture and in Mechanical, Electrical, and Civil Engineering. 1 rec.; 1 lec.; 2 cr.

25-26. Advanced Composition. Practice with compositions of varying lengths. Class discussions with illustrative readings. Weekly conferences. Mr. Towle. Prereq.: Engl. 1-2. 3 lec. or rec.; 3 cr.

27. English Grammar. Mr. Goffe. Prereq.: Engl. 1-2. Limited to students in the Teacher Preparation Program. 3 rec.; 3 cr.

43, 44, 45. Reading for Thought. Analysis of three forms of writing: 43, Exposition; 44, Fiction; and 45, Poetry. Mr. Bingham and Mr. Richardson. Prereq.: Engl. 1-2. 3 rec.; 3 cr. (Engl. 43 not offered in 1958-1959.)

53, 54. Writing As An Art. The study and practice of forms of writing, together with an examination of the history of literary philosophy. Practice in mutual criticism through class workshop discussions and written comment. Freedom in selection and pursuance of writing interests. Individual conferences. Engl. 25 or its equivalent. 2 lec.; 1 rec.; 3 cr. (Alternate years; not offered 1958-1959.)

55, 56. Chaucer. Mr. Call. 3 rec.; 3 cr. (Not offered 1958-1959.)

57, 58. Shakespeare's Plays. The major histories, comedies, and tragedies. Mr. Hennessy. 3 lec.; 3 cr.

59. Milton. Mr. Schultz. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

60. Boswell's Johnson. Mr. Maynard. 3 lec.; 3 cr. (Not offered 1958-1959.)

61. Wordsworth. Mr. Call. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

62. Browning. Mr. Daggett. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

63, 64. The Renaissance and English Literature, 1500-1600. Mr. Schultz. 3 lec.; 3 cr. (Alternate years; offered 1958-1959.)

65, 66. English Literature in the Seventeenth Century. Mr. Towle. 3 lec.; 3 cr. (Alternate years; Engl. 66 not offered 1958-1959.)

67, 68. English Literature in the Eighteenth Century. Mr. Maynard. 3 lec.; 3 cr. (Alternate years; offered 1958-1959.)

69, 70. The English Romantic Period. Wordsworth, Coleridge, Lamb, Byron, Shelley, Keats, Hazlitt, DeQuincey. Mr. Call. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

71, 72. Victorian Prose and Poetry. Major non-fictional prose from Carlyle to Stevenson and major poetry from Tennyson to Hardy. Mr. Hennessy. 3 lec.; 3 cr. (Alternate years; offered 1958-1959.)

73, 74. British Literature of the Twentieth Century. Mr. Daggett. 3 lec.; 3 cr. (Alternate years; offered 1958-1959.)

75. New England Renaissance. Emerson, Thoreau, and other transcendentalists. Mr. Daggett. 3 lec.; 3 cr. (Alternate years; offered 1958-1959.)

76. American Novel in the Nineteenth Century. Mr. Webster. 3 lec.; 3 cr. (Alternate years; offered 1958-1959.)

77. American Poetry of the Nineteenth Century. Mr. Daggett. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

78. American Humor and Satire. Mr. Webster. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

79, 80. American Literature of the Twentieth Century. Mr. Towle. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

81, 82. Introduction to English Drama. The development of English drama, exclusive of Shakespeare, from the Middle Ages to the present. Mr. Hennessy. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.

83, 84. The English Novel of the Eighteenth and Nineteenth Centuries. Mr. Bingham and Mr. Miller. 3 lec.; 3 cr. (Engl. 83 not offered 1958-1959.)

English-Education. (Engl.Ed) 91. Problems in the Teaching of High-School English. Principles and methods of teaching, literature and composition in secondary schools. For all students who plan to teach English in secondary schools, and for all students majoring in Language, History, or Education. Mr. Goffe. Prereq.: A grade of C or better in Educ. 58. Literature majors in English by permission of the instructor; all other students by fulfillment of the following: Engl. 13, 14; 16; 25; 36; 43; one semester of Engl. 57, 58; a demonstration of skill in the use of English grammar, either by the satisfactory completion of Engl. 27 or by examination. 3 lec. or rec.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

Speech

Mr. Cortez, *in charge*

The Speech Clinic. For any member of the University who wishes to have his voice and speech examined and corrected.

*B. Improvement in Speech. Required of all students whose speech is found to be unsatisfactory.

33, 34. Discussion and Debate. First semester: Techniques of problem solving adapted to the group situation, emphasizing the development of individual leadership. Second semester: How to convince others; argumentation as practiced in the court-room, in government and in every-day life. Mrs. Williamson. Prereq.: Engl. 1-2. 3 rec.; 3 cr.

35, (35). Public Speaking. The fundamental appeals and audience psychology; extemporaneous and impromptu speaking for every occasion. Mr. Cortez, Mr. Batcheller, and Mrs. Williamson. Prereq.: Engl. 1-2. 3 rec.; 3 cr.

(36). Speech for Teachers. Practice in reading announcements, short stories, prose, and poetry, with instruction in oral interpretation. Voice recording and analysis. Mr. Cortez. Prereq.: Engl. 1-2. For those who plan to be teachers. 3 lec.; 3 cr.

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* Any student may be recalled and reassigned to an instruction group at any time in his four years at college upon report of any member of the Faculty that his work in speech is deficient.

(39). RADIO SPEAKING. Practice in the preparation and delivery of radio continuity, reading, skits, talks, and announcements; microphone technique. Mr. Cortez. Prereq.: Engl. 1-2 and permission of the instructor. 3 rec.; 3 cr.

47, 48. DRAMATICS WORKSHOP. First semester: the fundamentals of acting, stage direction, stage deportment, and the analysis and development of roles in plays. Second semester: the methods of choosing, casting, and directing plays. Practical experience in productions. Mr. Batcheller. Prereq.: Engl. 1-2. 1 rec.; 2 lab.; 3 cr.

ENTOMOLOGY

JAMES G. CONKLIN, *Professor;* WALTER C. O'KANE, *Professor Emeritus;* ROBERT L. BLICKLE, *Professor;* WILLIAM R. LEE, *Assistant Professor*

2. ELEMENTARY ENTOMOLOGY. An introduction to entomology in its broad aspects. The structure, biology, and classification of insects. Each student is required to make an insect collection. Mr. Conklin. 2 lec.; 1 lab.; 3 cr.

41. INSECTS OF ORCHARD AND GARDEN. Principles of insect control; studies of the life histories, habits, and control of important insect pests of orchard, garden, and certain field crops; apparatus for applying insecticides. Mr. Conklin. 2 lec.; 1 lab.; 3 cr.

48. BEEKEEPING. Biology of the honey bee with emphasis on behavior and colony organization; colony management for pollination and honey production; practice in handling bees and beekeeping equipment. Mr. Lee. 2 lec. or 2 lab.; 2 cr.

54. MEDICAL ENTOMOLOGY. Insects and arachnids in relation to public health. The more important disease carriers, their biologies, and means of control. Adapted especially for students interested in public health or medicine. Mr. Blickle. Elective for juniors and seniors. 2 lec.; 1 lab.; 3 cr.

55. HOUSEHOLD INSECTS; STORED PRODUCTS INSECTS. The problems of pest prevention and control in buildings; pests of fabrics and clothing; insects affecting foodstuffs; termites and other insects attacking wooden structures. Mr. Conklin. 1 lec.; 1 lab.; 2 cr. (Alternate years; offered 1958-1959.)

56. FOREST INSECTS. Principles of forest entomology. Life histories and habits of the more destructive forest insects; forest insect control. Adapted especially for Forestry students. Mr. Conklin. Prereq.: Ent. 2. 1 lec.; 1 lab.; 2 cr.

57-58. ADVANCED ENTOMOLOGY. The anatomy and physiology of insects. Systematic entomology. Mr. Conklin, Mr. Blickle, Mr. Lee. Open to others than Entomology majors by permission of the Department Chairman. 2 lec.; 2 lab.; 4 cr.

59, 60. ADVANCED ECONOMIC ENTOMOLOGY. Problems in applied entomology and apiculture; the literature of economic entomology; investigational methods; studies of the specialized phases of entomology, Mr. Conklin, Mr. Blickle, Mr. Lee. Required of Entomology majors. Open to others than Entomology majors by permission of the Department Chairman. 1 to 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

FINE ARTS

(See The Arts)

FORESTRY

Clark L. Stevens, *Professor;* Lewis C. Swain, *Professor;* Bertram Husch, *Associate Professor;* Oliver P. Wallace, *Assistant Professor;* Harold W. Hocker, Jr., *Assistant Professor*

1. Forestry Principles. Fundamentals of forestry as applied to the orderly handling of woodlands. Mr. Swain. Elective for all students, except Forestry majors. 2 lec.; 1 lab.; 3 cr.

21. Forest Ecology Problems. Summer Camp course. Studies of several different forest types designed to show the inter-relations of plants and the important factors of their environment. The needs of the individual student are considered in planning the program. Mr. Hocker. Elective for any student. Forty hours of assigned reading and field work per week for 8 weeks. 10 cr.

25. Dendrology. The characteristics of native tree species, and the identification of trees in the field and from specimens. Additional practice in identifying northern species is given during Summer Camp. Mr. Stevens. Required of freshmen in Forestry. Elective for others. 1 lec.; 1 lab.; 2 cr.

26. Wood Identification. The uses of lumber; physical properties and identification of the commercially important woods. Mr. Swain. Prereq.: Permission of the instructor. 2 lec.; 1 lab.; 3 cr.

27. Silvics. Considers the effect of the environment of the forest; forces which influence the growth of trees and stands; practice in measuring the intensity and duration of environmental factors; detailed as well as general studies of forest vegetation. Mr. Hocker. Prereq.: Bot. 6. 2 lec.; 1 lab.; 3 cr.

28. Forest Mensuration. Theory and practice in the elementary principles of forest mensuration, forest inventory, and mapping. Study and application of basic statistical theory to forest mensuration. Mr. Husch. Prereq.: Math. 2 and 3. 2 lec.; 2 lab.; 4 cr.

29-30. Silviculture. The art of producing and tending a forest. Seed collection, storage, and testing; nursery practice; forest plantations; natural regeneration, intermediate cuttings; silvicultural practice. Mr. Hocker. For majors in Forestry. Elective for others with approval of the instructor. 2 lec.; 1 lab.; 3 cr.

31, 32. Forest Utilization. Methods of logging and milling in the chief lumber-producing regions of the United States; forest products, their manufacture and markets; with special problems of the lumber business. Mr. Swain. Prereq.: Permission of the instructor. 2 lec.; 1 4-hr. lab.; 4 cr.

33. Forest Protection. Protection of the forest from fire, insects, fungi, climatic extremes, and other injurious agencies. Mr. Wallace. For seniors in Forestry. Elective for others with approval of the instructor. 2 lec.; 1 lab.; 3 cr.

34. Forest Fish and Game. Designed to acquaint the student with the fundamental principles underlying the management of wildlife as a forest

crop. Mr. Stevens. For juniors in Forestry. Elective for others with approval of the instructor. 2 lec.; 1 lab.; 3 cr.

37. Forestry Recreation. Principles and methods of planning, designing, and administering public and semi-public forest recreation areas. Mr. Wallace Elective for juniors and seniors in Forestry. 2 lec.; 1 lab.; 3 cr.

38. Woodcraft. Use of the forest in recreational programs for campers. Outdoor education methods, materials, and equipment. Mr. Stevens. Required for women in Physical Education, Recreation Education option. Elective for other women students. Prereq.: Permission of the instructor. 2 lec.; 1 lab.; 3 cr.

39-40. Forest Management. The management of forest areas on an economic and ecological basis. The integration and application of business methods and the technical phases of forestry. Preparation of working plans. Mr. Husch. Prereq.: For. 27-28; 29-30; 41 or 42. 2 lec.; 2 lab.; 4 cr.

41. Game Management Field Practice. Summer Camp course. Field work on the University Forest at Passaconaway, N. H., and on a game management area of the White Mountain National Forest. Mr. Stevens. For students in Game Management group. Elective for others by permission of the instructor. Forty hours per week for 8 weeks. 10 cr.

42. Forest Engineering. Field practice at Summer Camp in forest mapping and surveying. Mr. Husch. Prereq.: For. 28, C.E. 7. Forty hours per week for 3 weeks. 4 cr.

43. Advanced Mensuration. The principles of sampling, volume table construction and application, the study of growth and yield, and methods of prediction. Application of graphic and statistical solutions to these problems. Mr. Husch. Prereq.: For. 28, 45. 2 lec.; 1 lab.; 3 cr.

44. Forest Economics. Application of economics and finance to the forest business. Nature of forest investments, forest taxation, and forest insurance. Mr. Wallace. Prereq.: Math. 2; Econ. 1. 3 lec.; 3 cr.

45. Timber Survey. Field practice at Summer Camp in forest inventory. Includes field work in the application of silvicultural principles and field trips for observation and study of current practices being used on private and public forest lands. Special emphasis to be given to commercial tree species of the northern hardwood and spruce-fir forest types. Mr. Wallace and Mr. Hocker. Prereq.: For. 28; C.E. 7. Forty hours per week for 5 weeks. 6 cr.

53. Wildlife Ecology Problems. Summer Camp course. Special problems in the ecology of forest fish and game. Mr. Stevens. Open to advanced students or to those who show unusual promise in wildlife research. Prereq.: Permission of the instructor. Forty hours per week for 8 weeks. 10 cr.

55, 56. Forest Game Management. Readings and discussions on the properties of game populations, and the various phases of management, including public relations. The principles of forest management, and the preparation of a working plan for the management of forest and wildlife resources on a specified area. The student may be required to spend several week-ends working with the State Fish and Game Department, helping with investigational projects. Mr. Stevens. For seniors in Wildlife Management. 2 lec.; 1 4-hr. lab.; 4 cr.

57. Aerial Photogrammetry in Forestry. Elementary principles of photogrammetry with emphasis on their application to all phases of forestry. The

value and use of aerial photos in forest typing, planimetric, and topographic mapping; measurement of area and volume estimation. Mr. Husch. Prereq.: Math. 3 and permission of instructor. 2 lec.; 2 lab.; 4 cr.

61, 62. PROBLEMS IN (A) FOREST ECOLOGY; (B) PHOTOGRAMMETRY; (C) FOREST UTILIZATION; (D) WILDLIFE; (E) MENSURATION; (F) FOREST ECONOMICS. Work to be arranged according to the needs of individual students. Mr. Stevens, Mr. Swain, Mr. Husch, Mr. Wallace, and Mr. Hocker. Prereq.: Senior or graduate standing and permission of the instructor. Hours to be arranged. 2 to 4 cr.

64. FOREST INDUSTRY ECONOMY. Economy in productive enterprise — logging and manufacturing of forest products; control of harvesting costs as a factor in intensifying applied forest management; planning for minimum cost operations. Mr. Wallace. For seniors in Forestry. Prereq.: Math. 2; Forestry 31, 44. 3 lec.; 3 cr.

FRENCH

(See Languages)

GEOLOGY AND GEOGRAPHY

NATHANIEL MCL. SAGE, *Assistant Professor;* T. RALPH MEYERS, *Professor;* DONALD H. CHAPMAN, *Professor;* GLENN W. STEWART, *Assistant Professor;* CECIL B. SCHNEER, *Assistant Professor;* WILLIAM H. WALLACE, *Assistant Professor of Geography*

Geology

1-2. PRINCIPLES OF GEOLOGY. The earth and its history. A consideration of land forms and a discussion of the materials and structures of the earth's crust. The interpretation of past geologic events, and their effect on the development of life forms. Mr. Meyers, Mr. Chapman, Mr. Stewart, and Mr. Sage. 3 lec. or rec.; 1 lab.; 4 cr. *This course cannot be used for major credit.*

7. GENERAL GEOLOGY. A general introductory course in physical geology. The structures and materials of the earth's crust and the forces which have produced and altered them. Mr. Stewart. For students in Technology and Agriculture. *Open to Liberal Arts students by permission only.* 2 lec. or rec.; 2 cr. *(Not available for credit after completing Geol. 1.)*

27. PHYSICAL-CHEMICAL MINERALOGY. An introduction to the theory of natural solids; the structure of the atom; the crystal, its geometry, its physics and chemistry, its natural history; methods of physical-chemical mineralogy. Mr. Schneer. Prereq.: Chem. 4. 2 lec.; 1 lab.; 3 cr.

28. DESCRIPTIVE AND DETERMINATIVE MINERALOGY. A study of the physical and chemical properties of minerals, their associations, modes of occurrence and uses; with training in their identification. Mr. Meyers. Prereq.: Geol. 1 or 7. 2 lec.; 2 lab.; 4 cr.

31. GEOMORPHOLOGY. The factors producing the present aspect of the land surface, particularly that of New England. Special emphasis on the work of

running water, glaciers, and marine agents. Field trips during the fall season. Mr. Chapman. Prereq.: Geol. 2 or permission of the instructor. 3 lec. or rec.; 1 lab.; 4 cr.

32. Glacial Geology. A study of the characteristics of existing glaciers and an interpretation of Pleistocene glacial features. The abundant and varied evidence of glaciation in northeastern North America and Baltic Europe will be emphasized. New Hampshire examples of both Alpine and Continental glaciation will be studied in the field. Mr. Chapman. Prereq.: Geol. 2. 2 lec.; 1 lab.; 3 cr.

33. Structural Geology. The structural units of the earth's crust and the mechanics of their formation. Mr. Stewart. Prereq.: Geol. 2 and Trigonometry, or permission of the instructor. 3 lec. or rec.; 1 lab. or field work; 4 cr.

34. Elements of Petrology. The origin, modes of occurrence, and classification of rocks. Mr. Stewart. Prereq.: Geol. 33. 2 lec.; 1 lab. or field work; 3 cr.

36. Sedimentology. A study of the properties of sediments and sedimentary rocks, the sedimentary processes and environments, correlation procedures and basic stratigraphy in the field of petroleum and ground water geology. Mr. Sage. Prereq.: Geol. 2. 2 lec.; 1 lab.; 3 cr.

42. Field Geology. Training in basic field methods of geologic mapping. Mr. Stewart. Prereq.: Geol. 33. 1 lec.; 1 lab. or field work; 2 cr.

53-54. Economic Geology. First semester: the types of coal and their occurrence in the United States; petroleum, the structures in which it is found and the distribution and geology of oil fields, especially in the United States; industrial minerals and their utilization. Second semester: the metals, their ores, and the geology of important ore deposits. Mr. Meyers. Prereq.: Geol. 28. 3 lec. or rec.; 3 cr.

55. Invertebrate Paleontology. The classification, evolution, and stratigraphic occurrence of invertebrate animals as recorded by fossils. Field trips will be made to collect specimens and to study environments of living and fossil material. Mr. Sage. Prereq.: Geol. 2, or permission of the instructor. 3 lec.; 1 lab.; 4 cr.

57, (57). Geological Problems. Special problems by means of conferences, assigned readings, and field or laboratory work, fitted to individual needs from one of the areas listed below. Mr. Meyers, Mr. Chapman, Mr. Stewart, and Mr. Sage. Prereq.: Permission of the instructor. 1-2 cr. *This course may be repeated to a total of not more than 5 credits.*

a. Areal Geology
b. Geochemistry
c. Geomorphology, Advanced
d. Geophysics
e. Glacial Geology, Advanced
f. Groundwater Geology
g. Historical Geology, Advanced
h. Industrial Minerals
i. Micropaleontology
j. Mineral Fuels
k. Mineralogy, Advanced
l. Optical Crystallography
m. Ore Deposits
n. Paleontology, Advanced
o. Petrology, Advanced
p. Regional Geology
q. Sedimentation
r. Stratigraphy
s. Structural Geology, Advanced
t. Geology Seminar

DESCRIPTION OF COURSES

Geography

Register for the following courses as Geog. 1, etc. Courses in Geography cannot be used to satisfy the Science requirements, nor major requirements in Geology.

1, 2. World Geography. A general survey of the geography of the world. The course is organized in terms of the major cultural areas of the earth. The polar, European, and dry world cultural areas are considered during the first semester; the Oriental, African, Pacific, and new world cultural areas are analysed during the second semester. In each area the unique integration of physical and human features that produces the distinctive personality of the region is studied. Mr. Wallace. 3 lec. or rec.; 3 cr.

3. Physical Geography. A systematic study of the differentiation of the earth in terms of climate, landforms, vegetation, and soil; the regional synthesis of these physical features in selected areas. Mr. Wallace. 3 lec. or rec.; 3 cr. This course is not open to students who have taken both Geog. 21 and 22.

4. Cultural Geography. A systematic study of the geography of man. Differentiation of the earth in terms of population, settlement, and the basic economic activities, including agriculture, forestry, fishing, mining, manufacturing, and transportation. The inter-relations of cultural phenomena and physical features in selected areas. Mr. Wallace. 3 lec. or 3 rec.; 3 cr.

5. Political Geography. A geographical study of differences and similarities among the states of the world in terms of political character. In the course, analysis is made of the factors involved in the internal unity of states, as well as their external relations. Attention is focused upon the major world powers of the present period. Mr. Wallace. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

10. Geography of Anglo-America. A regional and topical analysis of the United States and Canada. Physical features, including climate, landforms, vegetation, and soils, and the cultural elements of population, settlement, agriculture, extractive activities, manufacturing, transportation, and political phenomena are studied in terms of their contributions to the character of the area. Mr. Wallace. *Not open to freshmen.* Prereq.: 3 hours credit in Geography or permission of instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

12. Geography of Latin America. The physical and economic geography of Mexico, Central America, and the South American countries, treated regionally. Mr. Wallace. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

21. The Weather. The interpretation of atmospheric phenomena; the heating and circulation of the atmospheres and the nature and movement of the air masses which influence the weather of North America and particularly of New England. Mr. Chapman. 2 lec. or rec.; 2 cr.

22. Climates of the World. Classification of climates of the world. Examples and brief descriptions of major climate types, and their influence on the life of man. Mr. Chapman. 2 lec. or rec.; 2 cr.

57, (57). Meteorological or Geographical Problems. Special problems by means of conferences, assigned readings, and laboratory work, fitted to individual needs. Mr. Chapman and Mr. Wallace. Prereq.: Permission of the instructor. 1-5 cr. *This course may be repeated to a total of not more than 5 credits.*

Physical Science

(Register for this course as Ph. Sci. 1-2.)

1-2. Man Copes with the Physical World. The principles and methods of physical science illustrated by the development of major scientific ideas on the physical world. The course is directed toward an understanding of the intellectual achievements and problems of science as part of culture. Mr. Schneer. 3 lec.; 1 lab.; 4 cr.

GERMAN

(See Languages)

GOVERNMENT

John T. Holden, *Professor;* Robert B. Dishman, *Professor;* Allan A. Kuusisto, *Associate Professor;* David C. Knapp, *Assistant Professor;* Leo F. Redfern, *Instructor*

All students majoring in Government must take Government 5 and 6. These two courses qualify the student for his major but may not be counted for major credit.

5. Elements of Political Science. An introduction to the study of politics and government in modern society. The course considers the scope and method of political science, the behavior of the individual and group in political society, the nature and structure of political power, and competing political ideologies, e.g., communism, elitism, democracy. Mr. Holden, Mr. Kuusisto, Mr. Dishman, Mr. Knapp, and Mr. Redfern. Open to all students. 3 lec. or rec.; 3 cr. (formerly Gov. 3).

6. Principles of American Government. A study of the origins and development of the national government in the United States. Emphasis will be placed on the role which legislators, administrators, judges, and the people themselves play in the governmental process and on the constitutional and political framework within which they operate. Mr. Holden, Mr. Kuusisto, Mr. Dishman, Mr. Knapp, and Mr. Redfern. Open to all students. 3 lec. or rec.; 3 cr. (formerly Gov. 1).

4. America in World Affairs. A study of the problems of American foreign relations. The formulation and execution of policy, the emergence of the United States as a world power, contemporary issues confronting the country, and policies adopted to meet these issues. Mr. Holden and Mr. Kuusisto. Open to all students. 3 lec. or rec.; 3 cr.

11, 12. Comparative Government. The subject matter of this course is divided into two parts. The first semester is a study of parliamentary governments, including Great Britain, France, Canada, and representative smaller states. The second semester will be given to Russia, Germany, and Japan. Mr. Kuusisto. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (formerly Gov. 7, 8).

13. State and Local Government: Structure and Process. A comparative examination of the role of state and local governments in the American

federal system. Consideration will be given to constitutional and legal powers, basic structure and process of legislative, executive, and judicial powers, and the inter-relationships between state and local governments. Mr. Redfern. Prereq: Gov. 6. 3 lec. or rec.; 3 cr. (Formerly Gov. 12.)

14. State and Local Government: Management and Functions. An analysis of the functions of state, county, and municipal governments and their administration. Consideration will be given the scope of state and local functions, including protection, public health and welfare, public works, education, regulation, etc., and the organization and methods employed in administering functions at the state and local levels. Mr. Redfern. Prereq: Gov. 13. 3 lec. or rec.; 3 cr.

15. Political Parties and Pressure Groups. A study of the fundamental problems of popular control of government. The history, programs, and functions of political parties. Major pressure groups, their organization, methods, and objectives. Party finance, nomination procedures and elections, machines and bosses, political campaigns, problems of public control, and political issues. Mr. Kuusisto. Prereq.: Gov. 6. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

16. Public Opinion and Propaganda. A study of public opinion and of the opinion-forming process. Propaganda techniques and methods; the propaganda of totalitarian governments: the influence of the press, the radio, and the motion pictures in molding opinion; polls as devices for measuring public opinion. Current-day problems involving an analysis of propaganda techniques and identification, propaganda organizations, goals, and strategy are emphasized. Mr. Dishman. Prereq.: Gov. 5, Psych. 1, or Soc. 1. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

17. Public Administration. An examination of the principal concepts of governmental administration, including theories of organization, administrative leadership, internal management, and administrative responsibility and control. Emphasis will be placed upon the relationship of group behavior and policy development to the administrative process. Mr. Knapp. Prereq.: Gov. 6, or Soc. 1. 3 lec. or rec.; 3 cr.

51. Administration of Justice. A study of the nature, sources, and problems of the law as distinguished from other forms of social control. In its approach the course is analytical and critical, tracing the origin and development of legal institutions from primitive times to the present and evaluating the modern role of judge, jury, and counsel in the administration of justice. In this way emphasis is given to the law in action, i.e., law as it is applied by our courts and practiced by lawyers rather than as it is formulated by the legislative and executive branches. Mr. Dishman. Prereq.: Gov. 5. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

52. The Supreme Court and the American Constitution. A case study of the American Constitution, stressing the basic constitutional principles on which the American political system is founded and their application to present-day social, political, and economic problems. In addition, emphasis will be given to the powers of Congress, the President, and the federal courts and to the constitutional limitation by which their respective powers are checked. Mr. Holden. Prereq.: Gov. 6. 3 lec. or rec.; 3 cr.

55. World Politics. A study of the basic driving forces in international relations, including the nature of political power and its extension or limitation. Such topics as geopolitics, nationalism, ideology, imperialism, interna-

tional economic relations, balance of power, warfare, regulation of arms, international law, and collective security will be discussed. Mr. Kuusisto. 3 lec. or rec.; 3 cr.

56. Foreign Policies of the Great Powers. A study of fundamental factors influencing contemporary foreign policy formulation of the United States, the Soviet Union, the British Commonwealth, and other significant powers. The course will emphasize problems and choices confronting policy makers of these powers in dealing with issues involving the United Nations, regional organizations, Western Europe, Middle East, and Latin America. Mr. Kuusisto. 3 lec. or rec.; 3 cr.

(59.). Natural Resources Policy and Administration. A study of the development and administration of public policy on land, water, and mineral resources. Special attention will be given to the historical development of governmental action in each of these areas, political conflicts on policy goals, and the administrative structure for carrying out current policies. Mr. Knapp. Prereq.: Gov. 6. 3 lec. or rec.; 3 cr.

63. Political Thought in the West. A survey of the principal political theories from Plato and Aristotle to the beginning of the modern liberal tradition. The course is designed to show the growth and development of political thinking and institutions in terms of the development of modern government. Special emphasis will be given to the development of the modern national state and to its fundamental institutions. Mr. Holden. 3 lec. or rec.; 3 cr.

64. Modern Political Thought. A survey of modern western political thought from the emergence of the nation state to the present. Special attention will be given to the meaning and growth of the basic patterns of thought on the Continent and in England, including liberalism, democracy, socialism, communism, fascism, and nazism. The contributions of American political thought as it grew from its English origins to the development of the American constitutional system will be emphasized. Mr. Holden. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

65, (65). Research in Government Problems. An individual research project in one of the fields of government, e.g., local or state administration, comparative government, international relations, international organization, political theory, politics, or public law to be prepared under the direction of a member of the staff. Emphasis will be placed on the method and sources of research in government. Members of the Department. Open to senior majors in Government. 3 cr.

67. Public Policy and Industry. A study of the role of government in promoting, regulating, and operating industry in certain key sectors of the American economy. Emphasis will be placed on tariff policy and subsidies, the antitrust and "fair trade" laws, unfair labor practices and the settlement of labor disputes, public utility regulation, and the operation of the Tennessee Valley Authority and other publicly-owned enterprises. The legal and political problems confronting New England will be given special stress. Mr. Dishman. Prereq.: Gov. 6. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

68. Contemporary South East Asia. A comparative study of the political and social development of South East Asia. The course will stress the significance of the role of independence and dependence; the competing influence of communism and Western democracy; the special significance of the role

of China, India, Great Britain, and the United States. The states to be studied include the Philippines, Laos, Cambodia, Viet Nam, Viet Minh, Thailand, Burma, Malaya, and Indonesia. Mr. Holden. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

HISTORY

Philip M. Marston, *Professor;* William Yale, *Professor Emeritus;* Gibson R. Johnson, *Associate Professor;* Allan B. Partridge, *Associate Professor;* David F. Long, *Associate Professor;* Robert C. Gilmore, *Assistant Professor;* Hans Heilbronner, *Assistant Professor;* Marion E. James, *Instructor;* Charles A. Jellison, Jr., *Instructor*

In these courses an important place is given to historical reading carried on in the reference room. Often a considerable part of the work is written.

The statements in regard to prerequisites are for Liberal Arts students. Agriculture and Technology students should consult the Department Chairman.

Basic Course

The following is a basic course which is required of all students in the College of Liberal Arts.

1, 2. Introduction to Contemporary Civilization. Designed to provide a background of appreciation of the social significance of man's environment, the nature of man, the cultural heritage from the past, recognition of historical allusions in literature and conversation, and knowledge of the general sequence of historic events. Prehistoric and historic social evolution. The historic explanation of modern life and an appreciation of the problems of contemporary society. Mr. Gilmore, Mr. Heilbronner, Miss James, Mr. Jellison, Mr. Johnson, Mr. Long, Mr. Marston, and Mr. Partridge. 3 lec. or rec.; 3 cr. *This course cannot be used to satisfy major requirements.*

Group A

11, 12. The Mediterranean World in Ancient and Classical Times. A study of the contributions made by the peoples of the Ancient Near East, the Hellenic and Hellenistic civilizations, and the Romans to Western civilization. Miss James. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Not open to students who have credit for the former History 11, 12, 13.)

19, 20. Modern European History. Europe from the end of the Middle Ages to our own times. The evolution of the national state; international relations; the expansion of Europe overseas; and the background of our modern Western civilization, especially its ideas, literature, and art. A basic course for those who wish to proceed further in the study of European history as well as a survey for those who are interested in special aspects of Western cultural development. Mr. Gilmore. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

21, 22. History of England. The history of the British Isles from earliest times to the present, and a consideration of the British Empire and Commonwealth of Nations. A parallel to English literature, a background to American political history, and a study of English culture and institutions in the democratic and social integration of the world. Mr. Partridge. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

31, 32 ASIA IN TRANSITION. The old and the new China, Japan, and India. A general introduction to the changes taking place in Asia. The impact of Europe, Russia, and America in the East. The response of the East in the form of political and cultural evolution and revolution. The rise and development of Chinese Communism. A basic course for those interested in cultural, political, industrial or business developments in the East and a general education course for an understanding of the East. Mr. Johnson. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (*Formerly Hist. 75, 76.*)

71, 72. HISTORY OF RUSSIA. A study of the development of the Russian state from its foundation to its present status as a world power. A major purpose of the course will be to increase the understanding of the present in terms of the past. In addition to political developments and foreign relations, emphasis will be placed on intellectual and ideological currents. Mr. Heilbronner. Prereq.: Hist. 19, 20. or permission of the instructor. 3 lec. or rec.; 3 cr.

Group B

7, 8. HISTORY OF THE UNITED STATES. A general survey of American history from Washington's first administration to the present. Political, social, economic, and diplomatic aspects are given equal attention. Mr. Jellison and Mr. Long. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

9, 10. LATIN-AMERICAN HISTORY. The development and influence of Spanish and Portuguese culture as a wide spread world force; the history of the Latin-American peoples; the relationship of Latin America to North America, particularly in view of recent growth in friendly and diplomatic relations. Mr. Partridge. *Not open to freshmen.* 3 lec. or rec.; 3 cr.

51, 52. COLONIAL AND REVOLUTIONARY AMERICAN HISTORY. Colonial beginnings in America, national rivalries, the English colonies, the Revolution, and our national life to 1789. Early forms of Americanism in the making. Mr. Marston. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

59, 60. SOCIAL AND CULTURAL HISTORY OF NEW ENGLAND. From the settlements to the present. The material and intellectual aspects peculiar to New England's social and cultural life. It is assumed that the student is familiar with the general history of New England. Mr. Marston. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

83, 84. THE FOREIGN RELATIONS OF THE UNITED STATES. Although primarily a study in the history of American diplomacy, as much attention as possible is given to the non-diplomatic aspects of foreign relations. Mr. Long. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

85. 86. TWENTIETH-CENTURY AMERICA. A study of the history of the United States since 1890. Emphasis is placed on economic discontent and political protest from the Populist Revolt to date; and on the world conditions changing and molding United States foreign policy. Mr. Long. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

Group C

23, 24. Historical Origins and Development of Christianity. The life, literature, religion, and social development recorded in the Old Testament are studied as a cultural background. An investigation of the historic data existing concerning the life, charactetr, and teaching of Jesus. The growth and expansion of the Christian movement. Designed to furnish students an opportunity to evaluate their own religious heritage in the light of contemporary thought. Mr. Johnson. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

25. History of Religion. A study of the leading ideas and practices, historically regarded as religious, with a view to working out an historically valid conception as to the nature of religion. The impact of the scientific revolution upon the supernatural world view and the consequent relegating of religion to a secondary place is traced. Our modern naturalistic world view is then explored as an intellectual basis for religious living, and traditional Christian beliefs are restated in the terminology of our age. Mr. Johnson. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

26. History of Religions. A study of the principal religions of the world. Chief attention given to Hinduism, Buddhism, Zoroastrianism, Confucianism, and Mohammedanism. The history, literature, and philosophy of the Oriental civilization and culture as a background. Mr. Johnson. *Not open to freshmen.* 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

History-Education 91. Problems in the Teaching of High-School History and Other Social Studies. Bibliography and new interpretations of history; the social studies curriculum, past and present; aims and objectives in the social studies; selection and organization of teaching material; teaching and testing technique. Special emphasis on teaching American History and the Problems of American Democracy. Mr. Long. Open to students who have satisfactorily completed Hist. 7, 8; six credits in other history courses (*exclusive of Hist. 1, 2*); six credits from Gov. 5, Econ. 1, or Soc. 1; and Educ. 58 with a grade of C or better. 3 lec. or rec.; 3 cr. (*This course may not be used to satisfy major requirements.*)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

HOME ECONOMICS

Anna Light Smith, *Professor;* Sarah Thames, *Associate Professor;* Mildred Turney, *Associate Professor;* Elizabeth Rand, *Associate Professor;* Frances Plates, *Assistant Professor;* Jean V. Purdy, *Instructor*

Child Development and Home and Family Living

25-26. Child Development. A study of the development and guidance of the child from the prenatal to the adolescent period with emphasis upon the preschool child through observation and work at the University Nursery School. Study of children in other situations may be included during the second semester. *Not open to freshmen.* 2 lec. or rec.; 1 lab.; 3 cr.

81, 82. Projects in Child Development. Discussion conferences and supplementary projects based upon special interests of the student. Work with children in the University Nursery School or in other situations. Prereq.: H. E. 25-26 and permission of the instructor. 1-3 cr.

83. Home and Family Living. A discussion of the economic and social problems confronting the family and their relationships to various aspects of homemaking. 3 lec. or rec.; 3 cr.

84. Personal, Family, and Community Health. A study of the principles which promote healthful living and their application to members of the family and to routine home nursing care. 1 lec.; 1 lab.; 2 cr.

Clothing and Textiles

2. Costume Selection. The selection of suitable and becoming clothing through the application of the principles of design, and a study of grooming, clothing budgets, and care of clothing. Prereq.: Arts 23. 1 lec.; 1 lab.; 2 cr.

3. Textiles. A study of the textile fibers and their characteristics, the manufacture of yarns and fabrics, and the finishing processes applied to fabrics as related to the ultimate use of textile materials. Prereq.: Chem. 1 and 2. 2 lec. or rec.; 1 lab.; 3 cr.

6. Principles of Clothing Construction. An introduction to the basic principles of clothing construction and the development of some skill in execution of these processes through application in construction of selected problems using commercial patterns. Prereq.: H. E. 2 and 3. 3 labs.; 3 cr.

31. Home Decoration. An application of the principles of design to the decorating of the home. Not open to Home Economics majors. 3 lec.; 3 cr.

32. Interior Decoration. An application of the principles of design to the decorating of the home together with laboratory experience in the construction of home furnishings and the renovation of furniture. Prereq.: Arts 23 and H.E. 6. 1 lec.; 2 labs.; 3 cr.

46. Textiles and Furniture. A study of the problems of purchase and use of furnishings for hotels, hospitals etc. Open to juniors and seniors. No credit will be given when H.E. 3 or 32 have been taken. Prereq.: Arts 23 and Chem. 1, 2. 2 lec.; 1 lab.; 3 cr.

(60), 60. Flat Pattern. A study of the principles of developing designs from a basic pattern by the flat pattern method; and the development of original patterns and garments. Prereq.: H.E. 6. 2 labs.; 3 cr.

61, (61). Tailoring. A study of the principles of constructing tailored garments and the application of the principles through construction of a suit or coat. Prereq.: H.E. 6. 2 labs.; 3 cr. (Alternate years; not offered 1958-1959.)

63, (63). Draping. A study of the basic principles of fabric manipulation in the draping processes and the evolution of patterns and garments through this method. Prereq.: H.E. 6. 2 labs.; 3 cr.

65. History of Costume. A study of costume (and textiles) from primitive times to the present and the relationship of the mores of each period to the development of the costume for the respective era. Open only to juniors and seniors. Prereq.: Soc. 1 or Psych. 1 or Educ. 41, 42. Recommended: Hist. 1, 2. 3 lec. or rec.; 3 cr.

66. Costume Design and Fashion Illustration. The development of some skill in the delineation of fashion figures, and the sketching of original costume designs derived from various sources of inspiration. Prereq.: H.E. 6. H.E. 65 is recommended. 2 labs.; 2 cr.

(68), 68. Fundamentals of Fashion. A study of economical, psychological, and sociological problems inherent in the field of fashion. A survey of the development of the fashion industry. A study of the outstanding persons in the field. Open to seniors. Prereq.: Econ. 25, B.A. 46, Psych. 2, and Soc. 1. 2 labs.; 2 cr.

69. Advanced Textiles. An introduction to the chemical and physical testing of textiles and assigned readings of technical literature in the field. Prereq.: H.E. 3, Chem. 45. Phys. 1, and Bact. 1. 1 lec. or rec.; 2 lab.; 3 cr.

Foods and Nutrition

9. Food Selection. A course intended to aid the individual to understand the importance of food and nutrition in achieving and maintaining good health. Lecture and demonstration. 2 lec.; 2 cr.

15-16. Food Preparation. A fundamental course based on the knowledge and application of the scientific principles involved in the composition, selection, preparation, and preservation of foods. Prereq.: Chem. 1-2. 1 lec.; 2 lab.; 3 cr.

71. Experimental Foods. A study of research and technological advances in the preparation and preservation of foods with an opportunity to experiment with specific foods in the laboratory. Prereq.: H.E. 15-16; Ag. Chem. 6 or concurrently with Ag. Chem. 51. 1 lec.; 1 lab.; 2 cr. (Alternate years; not offered 1958-1959.)

72. Meal Planning and Table Service. The planning, preparing, and serving of meals. Prereq.: H.E. 15-16. 1 lec.; 1 lab.; 2 cr.

75. Advanced Foods. A more comprehensive study of the chemical and physical properties of foods and discussion of current research. Prereq.: H.E. 15-16; Ag. Chem. 6. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1958-1959.)

73. Nutrition. The application of the fundamental principles of the physiological and social sciences and their relationships to human nutrition. A knowledge of the nutritive value of foods, essential nutrients which promote growth and health, effect of food on the body, and adjustment of diet to varying income levels. Prereq.: Ag. Chem. 6 or concurrently with Ag. Chem. 51. 2 lec.; 1 lab.; 3 cr.

74. Nutrition in Health and Disease. A study of the modification of the normal diet and how nutrition is used as a therapeutic measure in the treatment of disease. Prereq.: H.E. 73. 2 lec.; 1 lab.; 3 cr.

76. Nutrition Seminar. Discussion of research and experimental work in human nutrition. Exploration of current periodicals, reports, and assigned readings. Prereq.: Permission of the instructor. 3 rec.; 3 cr.

Home Economics Education*

91. Principles and Problems of Home Economics Education. A study of the principles, procedures, and problems involved in developing school and community education with their implications for home economics. Prereq.: Educ. 41-42, 52. 2 lec.; 1 lab.; 3 cr.

93. Nutrition Education. A study of the principles, procedures, and problems involved in the educational program for dietitians and nutritionists. Prereq.: H.E. 73, 74, and Psych. 1, 47. 3 lec.; 3 cr.

94. Supervised Teaching in Home Economics. Eight weeks of supervised teaching. Prereq.: Educ. 41, 42, 52, and H.E. 91. 7 cr.

96. Seminar in Home Economics Education. Discussion and follow-up of problems encountered by students after having completed supervised teaching. Assigned readings and discussions of the current literature in the field of home economics education. For seniors majoring in Teacher Preparation. Hours to be arranged. 3 cr. Offered last eight weeks of second semester.

98. Preparation and Evaluation of Illustrative Materials. Emphasis will be given to the preparation of display cases, bulletin boards, posters, and other illustrative materials pertaining to home economics. Each student will have an opportunity to work in her major area. Open to juniors and seniors in Home Economics. 2 lec.; 2 labs.; 2 cr. Offered last eight weeks of second semester.

Home Management

33. Home Management. The management of human and material resources in daily living, with emphasis on home living. Open to juniors and seniors. 2 lec.; 1 lab.; 3 cr.

35, (35). Home Management Residence. The integration and application of management principles in the operation of the home. Students live in the Elizabeth DeMeritt House for a period of seven weeks. All married students registering for H.E. 35, and living with their husbands, may fulfill the requirements of the course by living in the House or by carrying out a supervised program in their own home. Those not living with their husbands at the time the course begins shall live in the House for the course period. Prereq.: H.E. 33 and permission of instructor. For juniors and seniors. Offered twice each semester. 3 cr.

Housing and Equipment. (See Agricultural Engineering 2.)

Institutional Administration

51-52. Quantity Foods and Purchasing. A study of the quantity production and buying of food. Principles of large quantity methods and standards as applied to hotels and institutions. Laboratory work in the quantity cookery laboratory and University Dining Hall kitchens. Prereq.: H.E. 15-16. 1 lec.; 1 4-hr. lab.; 3 cr.

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* Projects in areas of Home Economics are required of students in this curriculum in the summers following the sophomore and junior years. These projects may be accomplished at home or in conjunction with a work experience. Plans should be approved by the advisor during the preceding semester.

53. Organization and Management of Institutional Food Service. Presenting problems of personnel policies, menu planning, production and merchandizing, plant planning, maintenance, and sanitation as related to institutional food service. Prereq.: H.E. 51-52. 3 lec. or rec.; 3 cr. This course may be taken concurrently with H.E. 55.

55. (55). Institutional Accounting and Foods Control. Presenting methods of controls and systems of food cost accounting used in food service operations. Prereq.: H.E. 53 or may be taken concurrently with H.E. 53. 2 labs.; 2 cr.

56. (56). Catering. Opportunity is provided to gain experience in planning and executing special parties of various types. Prereq.: H.E. 51, 52. 2 labs.; 2 cr.

Field Work

(48), 48. Field Work. Residence and experience in an approved hospital or other type of institution for students majoring in Foods, Nutrition, and Institutional Administration. Field work experiences may be elected by other Home Economics majors. See curriculum requirements. Prereq.: Approval of adviser. 2-6 cr.

HORTICULTURE

Albert F. Yeager, *Professor;* J. Raymond Hepler, *Associate Professor Emeritus;* L. Phelps Latimer, *Associate Professor;* William W. Smith, *Associate Professor;* Russell Eggert, *Associate Professor;* John T. Kitchin, *Associate Professor;* Edward B. Risley, *Assistant Professor*

2. Plant Propagation. Discussion and practice including soil, sand, and peat media; seed treatments, seeding, watering, light, feeding, and temperatures; leafy, softwood, and hardwood cuttings; hormone treatment; budding, root, top- and bridge-grafting; seedbed nursery practice. Mr. Latimer and Mr. Smith. 1 lec.; 1 lab.; 2 cr.

4. General Horticulture. The principles and practices of horticulture, including fruits, vegetables, and ornamentals, as they apply to both commercial production and the growing of plants in and around the home. Mr. Risley with the aid of other members of the Department. Not recommended for Horticulture majors. 2 lec.; 1 lab.; 3 cr.

13. Horticultural Crops and Judging. Students are taught how to select fruits, vegetables, and flowers for exhibition, marketing, and domestic use. Instruction is also given in the management and judging of small fairs and exhibitions. A wide range of plants and varieties, both fresh and frozen, are used as class material. Required of all Horticulture majors and recommended for others who are training for such positions as county agricultural agents, home demonstration agents, club leaders, or Smith-Hughes teachers. Mr. Yeager and Mr. Latimer. 2 lab.; 2 cr.

27. Landscaping the Home Grounds. The design and maintenance of small properties with emphasis on the principles of arrangement and the use and identification of plant materials in the beautification of home surroundings. Mr. Risley. 2 lec.; 1 lab.; 3 cr.

37. Floral Arrangement. Floral design and the use of flowers in the home; practice in floral arrangement. A laboratory fee of $3 is charged. Mr. Risley. Prereq.: Permission of the instructor. 1 lab.; 1 cr.

44. Horticulture Practice. Seasonal practical work in fruit production, ornamentals, or vegetable production. Mr. Yeager and staff. For seniors who are deficient in important skills. 1 to 5 cr.

46. Outdoor Flowers. A study of the outdoor flowers that are commonly grown in the temperate region, including climatic requirements, principal varieties, and utilization. Mr. Risley. Prereq.: Hort. 2 and Bot. 1. 2 lec.; 1 lab.; 3 cr.

51, 52. Advanced Horticulture. Additional work for students majoring in Horticulture who require further specialization in the field of fruit, flower, vegetable production, or beekeeping. Mr. Yeager and staff. Prereq.: Permission of the Department Chairman. 1 to 3 cr.

53. Pomology: Orchard Fruits. Fundamental principles and experimental data and their applications to orchard problems including the establishment of orchards, soil management, water and fertilizer requirements, mineral deficiencies, training and pruning, fruit bud formation, pollination and fruit setting, thinning and winter injury. Mr. Latimer. 3 lec.; 3 cr.

54. Pomology: Small Fruit Culture. The culture and economic uses of the strawberry, raspberry, blackberry, blueberry, and grape. Each fruit is considered with relation to its history, propagation, planting, pruning, harvesting, marketing, insects and diseases, and domestic uses. Mr. Latimer. 2 lec.; 2 cr.

55. Systematic Survey of Fruits. Important species of fruits and nuts of temperate regions and their botanical relationships. The history, distribution, and merits of each species, and the horticultural varieties developed from it. Mr. Latimer. 2 lab.; 2 cr. (Alternate years; not offered 1958-1959.)

57. Systematic Survey of Vegetables. Important species of vegetables and culinary herbs and their botanical relationships. The history, distribution, and commercial merit of each species and the horticultural varieties developed from it. Mr. Kitchin. 2 lab.; 2 cr. (Alternate years; offered 1958-1959.)

58. Ericaceous Fruits. A course designed to cover both high- and lowbush blueberries and cranberries, including culture, propagation, harvesting, and marketing. Mr. Smith. For majors in Horticulture. 2 lec.; 2 cr.

59. Greenhouse Management. Modern methods of greenhouse management including soils, watering, costs of production and marketing, and fundamentals of plant behavior under glass. Varieties, culture, and enemies of greenhouse operations. Practical work in propagating, potting, and other greenhouse operations. Mr. Risley. 2 lec.; 1 lab.; 3 cr.

63. Principles and Practices of Vegetable Production. The development of the vegetable industry. Similarities and differences in management of vegetable production for fresh market, processing, seed, roadside sales, and home use. The significance of the plant processes of photosynthesis, respiration, and translocation to the vegetable grower. Environmental factors of soil, temperature, and moisture as they effect vegetable production. The management and role of plant growing structures, seed testing, variety selection, nutrition, weed control, and irrigation in the home garden and commercial plantings. Mr. Kitchin. 2 lec.; 1 lab.; 3 cr.

64. Commercial Vegetable Production. The commercial production, storage, and marketing of several different vegetable crops. The management and methods of culture, weed control, insect and disease control, nutrition, irrigation, and marketing of different types of vegetables and in different soils. The use and limitations of specialized equipment and chemicals together with a review of recent experimental work in vegetable production. Mr. Kitchin. 2 lec.; 1 lab.; 3 cr.

66. Nursery Management. The development of the nursery business. Factors that influence the location of a nursery, layout of the plant, soil and site, types of plants, pest control, inspection, digging, grading, storage, packing, shipping, and sales. Mr. Eggert. Prereq.: Hort. 2. 1 lec.; 1 lab.; 2 cr.

78. Commercial Greenhouse Crops. A survey of the principal greenhouse crops and an intensive study of their individual culture. Mr. Risley. Prereq.: Hort. 59. 2 rec.; 1 lab.; 3 cr.

91, 92. Horticulture Seminar. A review of recent horticultural literature and methods of investigation work. Students are required to prepare and present papers on selected topics. Mr. Smith and staff. For seniors in Horticulture. Others by permission of the Department Chairman. 1 lec.; 1 cr.

94. Plant Breeding. Application of the principles of genetics to practical plant breeding. Hybridization, chemical treatments, and selections as means of producing and improving varieties. Mr. Yeager. Prereq.: Zool. 61. 2 lec.; 1 lab.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

HOTEL ADMINISTRATION

Raymond R. Starke, *Professor*

The courses listed below are given primarily for students in Hotel Administration. Other students are invited to elect these courses with the permission of the instructor provided they have the prerequisites.

1. Orientation. A study of the scope of the hotel business, both resort and commercial, including a history of hospitality, and stressing the development of resort and commercial operations in the U. S. 2 lec.; ½ cr. *Required of freshmen in Hotel Administration.*

5. Hotel Operation. This course deals with the problems of hotel management. Some subjects studied are the organization, personnel, and work of the departments, front office procedure, rate structure, and the methods of securing and financing a hotel business. The point of view of the resort operator is constantly compared with that of the man in the year-round hotel. B.A. 9-10 should precede or accompany this course. 3 rec.; 3 cr.

6. Hotel Public Relations. The relation of the hotel with the public, either as prospective or present guests; sales promotion and advertising; legal liabilities and rights of a hotel keeper. For juniors and seniors. Prereq.: Permission of the instructor. 2 lec. or rec.; 2 cr.

Hotel Accounting. (See B.A. 1-2, 9-10.)

12. FINANCIAL STATEMENTS. A study of financial reports and statements directed toward costs and percentage in hotel operations. The work is based on the Uniform System of Accounts for hotels as recommended by the American Hotel Association. Prereq.: B.A. 9 or H.Ad. 5. 1 2-hr. rec.; 2 cr.

ELEMENTARY DRAFTING. (See Arts 20.)

FOODS. (See H.Ec. 15-16, 51-52.)

PERSONNEL MANAGEMENT. (See Psych. 32.)

TEXTILES AND FURNITURE. (See H.Ec. 46.)

23. STEWARDING. The management of the steward's department of a hotel, comprising the purchasing, storage, and issuing of foods, beverages, and supplies with the proper records to keep in connection therewith. This course will be given by an experienced steward. 2 lec. (one meeting on alternate weeks) ; 1 cr. (Alternate years; not offered 1958-1959.)

26. HOTEL ENGINEERING PROBLEMS. Basic principles of electricity and heat; laundry practices and equipment; kitchen planning and layouts; pumps and vacuum systems; water supply and use; fire protection; other mechanical problems of operating hotel or motel buildings. 3 lec.; 1 lab.; 4 cr.

27. HOTEL HOUSEKEEPING. The recruitment, training, and supervision of employees for this department. Purchasing and control of linen, supplies, and equipment. Standards of hotel operations. Care, maintenance, and repair of furnishings. Some attention is given to principles of decoration and choice of materials. Eight afternoons during the semester, 3 hours each; 1 cr. (Alternate years; offered 1958-1959.)

29. HOTEL SALES PROMOTION. Proven methods of securing and increasing the sales of food in restaurants and the sales of rooms, functions, and conventions for hotels. A series of lectures by visiting executives. 1 2-hr. period per week; 1 cr. (Alternate years; not offered 1958-1959.)

40, 42, 44, 46. LECTURES ON HOTEL MANAGEMENT. Delivered by representative and well-known men in the hotel business and allied fields ½ cr. for each course.

HUMANITIES

Register for this course as Hu 1-2.

1-2. HUMANITIES. A course in general education involving the Departments of Languages, English, Music, The Arts, and Philosophy, and designed to give an appreciation of literature, the various arts, and philosophy. The course will operate within an historical framework, but is not intended to be an historical survey. Weekly lectures or demonstrations, readings, slides, films, recordings, class recitations, and discussion. There will be at least one museum trip each semester. Mr. Casas, Mr. Daggett, Mr. Lepke, Mr. Maynard, Mr. Miller, Mr. Walsh and guest lecturers. *Not open to freshmen.* 1 lec. and 3 rec.; 3 cr.

LANGUAGES

JOHN S. WALSH, *Professor;* CLIFFORD S. PARKER, *Professor;* R. ALBERTO CASAS, *Associate Professor;* JAMES C. FAULKNER, *Associate Professor;* ARNO K. LEPKE, *Associate Professor;* LLOYD W. BUHRMAN, *Associate Professor;* ALEXANDER P. DANOFF, *Assistant Professor;* RALPH H. CRYESKY, *Assistant Professor;* CHARLES H. LEIGHTON, *Instructor*

General Language and Literature

Register for the following courses as Lang. 1, etc.

1, 2. SURVEY OF GREEK AND ROMAN LITERATURE. The masterpieces of Greek and Roman literature in translation. Through the study of literature, the students will learn about the ancient civilizations from which much of our contemporary culture has come. A cultural course for the general student unprepared to read the original languages but desiring acquaintance with this important subject matter. A background course for majors in such subjects as English, History, Latin, or the modern languages and literatures. Continued in Languages 51, 52. Mr. Walsh. *Not open to freshmen.* 3 rec.; 3 cr.

51, 52. SURVEY OF MODERN EUROPEAN LITERATURE. The Renaissance, classicism, romanticism, and realism studied as international movements. Stress will be laid, not upon the details of each national literature, but upon the interdependence of the literatures of the various countries. Conducted in English. Mr. Lepke. 3 rec.; 3 cr.

73. INTRODUCTION TO ROMANCE PHILOLOGY. The historical development of French and Spanish from Vulgar Latin. Phonology, morphology, syntax, semantics, etymology. Frequent reference is made to the spoken languages of today as well as to comparative semantics. Mr. Cryesky. Prereq.: One year of Latin and familiarity with two Romance Languages. 3 rec.; 3 cr. (Alternate years; offered 1958-1959.)

LANGUAGE-EDUCATION (LANG-ED) 91. PROBLEMS IN THE TEACHING OF MODERN LANGUAGES IN THE HIGH SCHOOL. The special objectives, methods, and devices of modern language teaching in high school. For prospective teachers of French, German, and Spanish. Mr. Leighton. Prereq.: Education 58 with grade of C or better (or one year of teaching experience) and one of the following courses: French, German, or Spanish 6 or 14. 3 rec.; 3 cr.

French

Register for the following courses as Fr. 1, etc.

New students will be assigned to French 1, French 3, or French 5, on the basis of their performance in the French placement examination.

*1-2. ELEMENTARY FRENCH. Elements of French grammar, reading of simple prose, oral practice. As part of their preparation, students must attend the language laboratory two half-hour periods per week. 3 rec.; two half-hour lab.; 3 cr. *(Students who offer two entrance units* [two years of high-school work]

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* See page 192 for explanation of footnote.

in a language will not be permitted to register for the first semester of that elementary language course for credit. They may, however, audit the course with proper authorization.) Cannot be counted for major credit.

*3-4. INTERMEDIATE FRENCH. Language and civilization. Principal objectives; (1) to improve the students' ability to read, speak, understand, and write French; (2) to study the civilization of France. As part of their preparation, students must attend the language laboratory two half-hour periods per week. Mr. Parker, Mr. Faulkner, and Mr. Buhrman. Prereq.: Fr. 2 or its equivalent. 3 rec.; 2 ½-hr. lab.; 3 cr.

5-6. INTRODUCTION TO FRENCH LITERATURE. By means of lectures, analysis of texts, and collateral reading, representative French authors from the 17th century to the present will be studied. Occasional class meetings will be devoted to speaking and writing French. Mr. Parker. Prereq.: Fr. 4 or its equivalent. 3 rec.; 3 cr. *Required of majors in French.*

7, (7). FRENCH LABORATORY. Methodical and intensive training in oral expression and aural comprehension for students who wish to acquire, develop, and maintain aural-oral facility in the French language. Mr. Faulkner. Prereq.: Elementary French and permission of instructor. 4 labs., ½ hr. each; 1 cr. May be taken for credit no more than four times. *May not be taken concurrently with Fr. 13-14.*

13-14. FRENCH COMPOSITION AND CONVERSATION. The correct and fluent use of written and spoken French taught by careful attention to grammar and composition and by laboratory methods. Mr. Faulkner. Prereq.: Fr. 4 or its equivalent. 2 rec.; 4 lab.; ½ hr. each; 3 cr.

51-52. FRENCH LITERATURE OF THE MIDDLE AGES AND THE RENAISSANCE. The various forms and masterpieces of French literature from the beginning to the year 1600. Reading in modern French versions. Mr. Parker. Prereq.: Fr. 5-6 or the equivalent. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

53-54. FRENCH LITERATURE OF THE SEVENTEENTH AND EIGHTEENTH CENTURIES. French literature from 1600 to the French Revolution. Topics studied include: the rise and development of the classical ideal, the masterpieces of the great writers of the age of Louis XIV, the decline and disintegration of classicism in the 18th century; the work and influence of Voltaire and Rousseau; the novel and drama in the 18th century. Prereq.: Fr. 6. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

55. FRENCH ROMANTICISM AND REALISM. The period from 1800 to 1870; Chateaubriand and Mme. de Stael; the Romantic School (Lamartine, Hugo, etc.); the historical novel and drama; early realists; romanticism and realism in works of Balzac, realism in the novel and drama (Flaubert, Augier, Dumas fils); Parnassian poetry (Laconte de Lisle, Baudelaire). Prereq.: Fr. 6. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

56. FRENCH LITERATURE FROM 1870 TO 1940. Principal topics; Zola and naturalism; the reaction from naturalism; the poetry of Verlaine, Rimbaud,

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* No student from a foreign country will be permitted to register for any language course numbered 1-2 or 3-4 (except Greek 1-2, 3-4) in such student's native language.

No student who has taken any course in a foreign language numbered above 4 (except Fr. 7) will be permitted to register for a course in the same language numbered 4 or lower.

Any exception to these rules must be approved by the Chairman of the Department and the Dean of the College of Liberal Arts.

Mallarme, and Claudel; Proust and Gide; surrealism; conservatives and innovators between the two World Wars. Mr. Parker. Prereq.: French 55. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

57, (57). CONTEMPORARY FRENCH PROSE. A study of the works of Proust, Gide, Mauriac, Sarte, Malraux, and Camus with attention to artistic, ethical, and moral concepts as related to the intellectual currents of the period. Mr. Buhrman. Prereq.: French 6. 3 lec.; 3 cr.

61-62. ADVANCED FRENCH GRAMMAR AND COMPOSITION. A systematic study of French grammar with much oral and written practice. For students who wish to perfect their command of written and spoken French, with a view to teaching, traveling or further advanced study. Conducted largely in French. Mr. Parker. Prereq.: Fr. 14 or the equivalent. 3 rec.; 3 cr.

72. FRANCE TODAY. A course designed to bring the students up to date on the realities of modern French civilization. It covers the most significant aspects and trends of literary, artistic, social, economic, and political life in France today. Lectures and discussions conducted in French. Mr. Faulkner. Prereq.: Fr. 14 or permission of instructor. 3 lec.; 3 cr. (Alternate years; not offered 1958-1959.)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

German

Register for the following courses as Ger. 1, etc.

New students will be assigned to German 1, German 3, or German 5 on the basis of their scores on the German reading examination.

*1-2. ELEMENTARY GERMAN. Elements of German grammar, reading of simple prose, oral practice. 3 lec. or rec.; 3 cr. *(Students who offer two entrance units* [two years of high-school work] *in a language will not be permitted to register for the first semester of that elementary language course for credit. They may, however, audit the course with proper authorization.)* Cannot be counted for major credit.

*3-4. INTERMEDIATE GERMAN. Designed to improve the student's ability to read, speak, and write German and to satisfy the needs of students of agriculture, engineering, and medicine. Mr. Lepke and Mr. Danoff. Prereq.: Ger. 2 or its equivalent. 3 rec.; 3 cr.

5-6. CIVILIZATION AND LITERATURE. This course will give the student a clear and complete view of German literature. Its aim is to distinguish and clarify the principal directions of German literature from its origins to the present. Attention will be paid to the interrelation of history and literature. Collateral readings. Mr. Lepke. Prereq.: Ger. 4. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

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* No student from a foreign country will be permitted to register for any language course numbered 1-2 or 3-4 (except Greek 1-2, 3-4) in such student's native language.

No student who has taken any course in a foreign language numbered above 4 (except Fr. 7) will be permitted to register for a course in the same language numbered 4 or lower.

Any exception to these rules must be approved by the Chairman of the Department and the Dean of the College of Liberal Arts.

13-14. German Composition and Conversation. For students who desire a fluent practical command of spoken and written German. Approximately two thirds of the class time will be devoted to conversation; the remaining part to composition and readings which will provide subject matter for oral work. Mr. Lepke. Prereq.: Ger. 4. 3 rec.; 3 cr. (Not offered 1958-1959.)

53-54. German Literature of the Eighteenth Century. German literature from the beginning of the century to the advent of Romanticism. Topics studied include: the rise and development of classicism, the masterpieces of Lessing, Goethe, and Schiller, the decline and disintegration of Classicism in the 18th century. Collateral readings. Prereq.: Ger. 6. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

55-56. German Literature of the Nineteenth Century. The period from 1800 to the death of Nietzsche will be studied from four points of view; (a) Rise and development of the Romantic School including the romantic opera (b) the drama as reflected in the works of Kleist, Grillparzer, Hebbel, Hauptmann, (c) the novel as an illustration of social and cultural conditions with emphasis on the humorists (Richter, Grabbe, Meyer, Keller, Busch), (d) the collapse of the idealistic systems of philosophy as reflected in the works of Schopenhauer, Nietzsche, and others. Prereq.: Ger. 6. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

57-58. Twentieth Century German Literature. Literature from 1900 to the present time including the schools of Naturalism, Impressionism, Expressionism, and "Neue Sachlichkeit." Emphasis is placed on the works of Kafka and of the Nobel-prize winners, Hauptmann, Spitteler, Thomas Mann, and Hesse. Readings and discussions will be supplemented by articles and commentaries from current German literary magazines. Prereq.: Ger. 6. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

Greek

Register for the following courses as Gr. 1, etc.

1-2. Elementary Greek. Grammar, composition, translation. Mr. Walsh. Prereq.: Permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

3-4. Intermediate Greek. Translation of several books of Homer's *Iliad*; work in grammar and word derivation. Mr. Walsh. Prereq.: Gr. 2. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

Italian

Register for the following as Ital. 1, etc.

*1-2. Elementary Italian. Elements of Italian grammar, reading of simple prose, oral practice. Mr. Cryesky. 3 lec. or rec.; 3 cr. *Cannot be counted for major credit.* (Alternate years; not offered 1958-1959.)

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* See page 195 for explanation of footnote.

Latin

Register for the following courses as Lat. 1, etc.

New students will be assigned to Latin 1, Latin 3, or Latin 5 on the basis of their scores on the Latin reading examination.

1-2. ELEMENTARY LATIN. Elements of grammar, reading of simple prose. Study of the changes in meaning and form of English and Romance language derivatives from Latin. 3 lec. or rec.; 3 cr. *(Students who offer two entrance units* [two years of high-school work] *in a language will not be permitted to register for the first semester of that elementary language course for credit. They may, however, audit the course with proper authorization.)* This course cannot be counted for major credit.

3-4. INTERMEDIATE LATIN. A review of Latin grammar and vocabulary, followed by readings in prose and poetry. Prereq.: Lat. 2 or the equivalent. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

5-6. LATIN PROSE AND POETRY. Study of selections from Livy, Catullus, Ovid, Phaedrus, Martial, and the odes of Horace. Translation, lectures, and study of the influence of Latin on English poetry. Mr. Walsh. Prereq.: Lat. 4 or equivalent. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

53-54. THE HISTORIANS. Livy, Suetonius and Tacitus will be studied in selected works. Illustrated lectures and outside readings will serve to provide the historical, social, and political background of Rome essential to the student or teacher of Latin. Prereq.: Lat. 6 or equivalent. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

55-56. THE GOLDEN AGE. A study of Roman literature of the classical period, particularly the works of Caesar, Cicero, and Virgil. Prereq.: Lat. 6 or its equivalent. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

Spanish

Register for the following courses as Sp. 1, etc.

New students will be assigned to Spanish 1, Spanish 3, or Spanish 5 on the basis of their scores on the Spanish reading examinations.

*1-2. ELEMENTARY SPANISH. Elements of Spanish grammar, reading of simple prose, oral practice, dictation. As part of their preparation, students must attend the language laboratory two half-hour periods per week. 3 rec.; two ½-hr. lab.; 3 cr. *(Students who offer two entrance units* [two years of high-school work] *in a language will not be permitted to register for the first semester of that elementary language course for credit. They may, however, audit the course with proper authorization.)* This course cannot be counted for major credit.

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* No student from a foreign country will be permitted to register for any language course numbered 1-2 or 3-4 (except Greek 1-2, 3-4) in such student's native language.

No student who has taken any course in a foreign language numbered above 4 (except Fr. 7) will be permitted to register for a course in the same language numbered 4 or lower.

Any exception to these rules must be approved by the Chairman of the Department and the Dean of the College of Liberal Arts.

*3-4. Intermediate Spanish. Language and civilization. Principal objectives: (1) to improve the student's ability to read, speak, write, and understand Spanish; (2) to study the civilization of Spanish-speaking countries. As part of their preparation, students must attend the language laboratory one half-hour period per week. Mr. Cryesky. Prereq.: Sp. 2 or its equivalent. 3 rec.; one ½-hr. lab.; 3 cr.

5-6. Spanish Civilization and Literature. This course will give the student a clear and complete view of Spanish literature. Its aim is to distinguish and classify the principal directions of Spanish literature from its origins to the present. Attention will be paid to the interrelation of history and literature. Collateral readings. Mr. Leighton. Prereq.: Sp. 4. 3 lec. or rec.; 3 cr.

13-14. Spanish Composition and Conversation. The use of written and spoken Spanish taught by careful attention to pronunciation, grammar, and composition. Approximately two thirds of the class time will be given to conversation; the remaining part to composition and readings which will provide subject matter for oral work. Mr. Casas. Prereq.: Sp. 4. 3 rec.; two ½-hr. lab.; 3 cr.

31-32. Advanced Spanish Conversation and Composition. For students who wish to perfect their command of written and spoken Spanish. This course aims at maintaining aural-oral fluency in Spanish through intensive work in and out of the classroom, individual conferences, and laboratory sessions. Mr. Casas. Prereq.: Span. 14 or equivalent. 3 lec.; two ½-hr. lab.; 3 cr. (Not offered 1958-1959.)

51. Spanish Literature up to 1600 and Cervantes. Readings and discussion of the great human creations of early Spanish literature such as El Poema del Mio Cid, El Libro de Buen Amor, La Celestina and Don Quijote, and their social and historical background. The first part of the course will cover early Spanish literature up to Cervantes. The second part of the course will be devoted entirely to Cervantes: his life, drama, Novelas Ejemplares, and his masterpiece Don Quijote. Mr. Cryesky. Prereq.: Sp. 6 or equivalent. 3 lec.; 3 cr. (Not offered 1958-1959.)

52. Drama and Poetry of the Siglo de Oro. Discussion of the social background of the baroque period and readings of the representative plays of Lope de Vega, Calderon, Alarcon, Tirso de Molina, and the poetry of Gongora and Quevedo. Development of the prose of the period. Mr. Cryesky. Prereq.: Sp. 6 or equivalent. 3 rec.; 3 cr. (Not offered 1958-1959.)

55. Literature of the Nineteenth Century. After a preliminary survey of the 18th century, this course will cover the readings and discussion of the main literary movements and writers of the 19th century such as Quintana, Espronceda, Zorrilla, Larra, Duque de Rivas, Becquer, Perez Galdos, Valera, Pereda, Clarin, and Echagaray. Social and historical background of Spain in relation to 19th century thought in Europe. Mr. Casas. Prereq.: Sp. 6 or equivalent. 3 rec.; 3 cr. (Not offered in 1958-1959.)

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* No student from a foreign country will be permitted to register for any language course numbered 1-2 or 3-4 (except Greek 1-2, 3-4) in such student's native language.

No student who has taken any course in a foreign language numbered above 4 (except Fr. 7) will be permitted to register for a course in the same language numbered 4 or lower.

Any exception to these rules must be approved by the Chairman of the Department and the Dean of the College of Liberal Arts.

56. Contemporary Spanish Literature. Starting with the generation of 1898 this course will cover the readings and discussion of the work of such writers as Unamumo, Azorin, Baroja, Machado, J. R. Jimenez, Ortega y Gasset, Garcia, Lorca, Perez de Ayala, Casona, Benavente, and a survey of Spanish literature and thought since 1939. Mr. Casas. Prereq.: Sp. 6 or equivalent. 3 rec.; 3 cr. (Not offered 1958-1959.)

65, 66. Spanish-American Literature. Lectures and discussion on the main themes of Spanish-American literature through the reading of the works of the most representative authors along with an historical, social and geographical background of the New World. Mr. Casas. Prereq.: Sp. 6 or equivalent. 3 rec.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

LATIN

(See Languages)

LAW

(See Other Programs of Study, Page 81.)

LIBERAL ARTS

The following courses are non-departmental courses open only to seniors in the College of Liberal Arts. Register for them as L. A. 51, etc.

51, (51). Senior Synthesis: American Civilization in Transition. The purpose of this course is to assist the student in integrating the knowledge and skills which he has acquired. In the course the student is put into contact with a variety of ideas and methods which seem important to an understanding of our changing society. Emphasis is placed upon contact with experts in a variety of academic fields. The ideas, methods, and techniques of integration of these experts constitute the basic data for the course. Each Division of the College of Liberal Arts supplies guest speakers for the course. Guest speakers (one each week) in past years have come from the following departments and specialty areas: History, Sociology, Government, Economics, Education, English Literature, The Arts, Music, Drama, Geology, Zoology, and Philosophy. Mr. Menge, Mr. Lepke, and Mr. Jellison. *Prior to registration in L.A. 51, an interview with a member of the course staff is required.* Prereq.: Senior standing in the College of Liberal Arts, 1 two-hour lecture and discussion period with a guest speaker and 2 one-hour seminar periods. 3 cr.

97, (97). Independent Study. See description of the plan on page 93. Not less than 6 cr. nor more than 12 cr. for the year.

MATHEMATICS

William L. Kichline, *Professor;* Marvin R. Solt, *Professor;* Ruth M. Peters, *Associate Professor;* Donald M. Perkins, *Assistant Professor;* Robert O. Kimball, *Assistant Professor;* Frederick J. Robinson, *Assistant Professor;* Shepley L. Ross, *Assistant Professor;* Chester Feldman, *Assistant Professor;* Robert H. Owens, *Assistant Professor;* Donald C. Beard, *Lecturer;* Constance M. Foley, *Instructor;* Charles A. Sewell, *Instructor;* Florence P. Wojtaszek, *Instructor;* Barbara G. Houston, *Part-time Instructor*

2, (2). Intermediate Algebra. The elements of algebra. This course is intended primarily for students with only one entrance unit of algebra. Prereq.: One entrance unit of algebra. 3 rec.; 3 cr. *Does not count for major credit in Mathematics.* (Math. 2 may not be completed for credit in the College of Liberal Arts by a student who can satisfy the prerequisite for Math. 7-8).

3. (3). Trigonometry. The elements of trigonometry, logarithms. Prereq.: Math. 2 or 2 units of high school algebra and 1 unit of high school geometry. 3 rec.; 3 cr. *Does not count for major credit in Mathematics.* (May not be completed for credit in the College of Liberal Arts by a student who can satisfy the prerequisite for Math. 7-8).

7-8. Fundamental Mathematics. Selected topics from number theory, algebra, trigonometry, geometries, statistics, logic, calculus, and topology. Intended for Liberal Arts students who desire an introduction to the concepts of modern mathematics. This is the prerequisite for Math. 9-10. Prereq.: At least 3 entrance units of mathematics which should include at least 1½ years of algebra, 1 year of geometry, and ½ year of trigonometry. 3 rec.; 3 cr. *Does not count for major credit in Mathematics.*

9-10. Differential and Integral Calculus. Fundamentals of differential and integral calculus. Designed for Liberal Arts Mathematics majors. Prereq.: Math. 7-8. 3 rec.; 3 cr.

14, (14). Analytic Geometry. The elements of analytic geometry. Prereq.: Math. 13 and Math. 11 or 2. 3 rec.; 3 cr. (Will not be offered after the first semester of 1958-1959.)

16, (16). Calculus I. An introduction to differential and integral calculus. Prereq.: Math. 14 (may be taken concurrently). 3 rec.; 3 cr. (Will not be offered after the second semester of 1958-1959.)

17, (17). Calculus II. Integral calculus and applications. Prereq.: Math. 16 and Math. 14. 3 rec.; 3 cr. (Will not be offered after the second semester of 1958-1959.)

18, (18). Calculus III. Infinite series. Taylor's expansion, partial differentiation, multiple integrals. Prereq.: Math. 17. 3 rec.; 3 cr. (Will not be offered after the first semester of 1959-1960.)

19, (19). Differential Equations. A first course in ordinary and partial differential equations. Prereq.: Math. 18. 3 rec.; 3 cr. (Will not be offered after the first semester of 1959-1960.)

20. Applied Mathematics. Fourier series, line and surface integrals, partial differential equations of mathematical physics and engineering, Bessel

and Legendre functions, introduction to boundary value problems, vector analysis. Prereq.: Math. 19. 3 rec.; 3 cr. (Will not be offered after the second semester of 1959-1960.)

21. TECHNOLOGY MATHEMATICS I. Review algebra, elements of analytic geometry, introduction to differential and integral calculus. Prereq.: At least 3½ entrance units of mathematics, which should include at least two years of algebra, one year of geometry, and a half year of trigonometry. 5 rec.; 5 cr.

22. TECHNOLOGY MATHEMATICS II. Review of exponential, logarithmic and trigonometric functions, their differentiation and integration, parametric equations, polar coordinates, solid analytic geometry. Prereq.: Math. 21. 5 rec.; 5 cr.

23. TECHNOLOGY MATHEMATICS III. Continuation of techniques of differentiation and integration, partial derivatives, multiple integrals, infinite series. Prereq.: Math. 22. 5 rec.; 5 cr. (Will not be offered in 1958-1959.)

24. DIFFERENTIAL EQUATIONS. A first course in ordinary differential equations. Prereq.: Math. 23 or Math. 10. 3 rec.; 3 cr. (Will not be offered in 1958-1959.)

30. ASTRONOMY. A brief descriptive course. A study of the physical characteristics and motions of the members of the solar system and the sidereal universe. Illustrated lectures, recitations, and practice in the use of equatorial telescope. Mr. Solt. Prereq.: One year of college physical science. 3 rec.; 3 cr.

38. HISTORY OF MATHEMATICS. An historical background and an appreciation of the development of various fields of mathematics. Designed especially for those preparing to teach mathematics in high school. Prereq.: Math. 17, 23, or 10. (Math. 10 may be taken concurrently.) 3 rec.; 3 cr. (May be counted as major credit only by students preparing to teach mathematics in the secondary schools.)

40. PROJECTIVE GEOMETRY. A first course in projective geometry. Prereq.: Math. 18, 23, or 10. (Math. 10 may be taken concurrently.) 3 rec.; 3 cr.

43-44. INTRODUCTION TO MATHEMATICAL STATISTICS. Averages, frequency distributions and their moment characteristics, probability, correlation, sampling theory, fiducial inference, tests of significance. Prereq.: Math. 14 and 16 or Math. 23 or 10. (Math. 23 may be taken concurrently with Math. 43.) 3 rec.; 3 cr.

46. STATISTICAL QUALITY CONTROL. An introduction to the application of statistical methods to control of quality of manufactured products and to acceptance sampling. Averages, measures of dispersion and distribution. The Shewhart control chart, and the use of standard acceptance sampling tables. Mr. Kichline. Prereq.: Permission of instructor. 1 rec.; 1 cr.

47-48. INTRODUCTION TO ANALYSIS. The real number system. A rigorous treatment of such topics as sequences, limit, convergence, continuity, the derivative, the Riemann integral, the elementary functions. This course is suggested as preparation for Math. 85-86. Prereq.: Math. 18. 3 rec.; 3 cr. (Will not be offered after 1959-1960.)

51-52. METHODS OF ADVANCED CALCULUS I, II. Vector analysis; series solutions of ordinary differential equations; Bessel and Legendre functions; Laplace transforms; characteristic value problems; Fourier series methods; methods of partial differential equations; partial differential equations of mathematical physics; introduction to the calculus of variations. Prereq.: Math. 24. 3 rec.; 3 cr.

54. NUMERICAL METHODS. Interpolation, integration, and differentiation based on Lagrange's and Newton's interpolation polynomials, including error analysis. Numerical solution of non-linear equations, differential equations, and problem preparation for digital computer solution. Least squares approximation and data smoothing techniques. Prereq.: Math. 19 or 24. 3 rec.; 3 cr.

59. FUNDAMENTAL CONCEPTS OF MATHEMATICS FOR TEACHERS. The real and complex number systems; elements of set theory; denumerable sets; cardinality of a set; algebraic systems; groups, fields, vector spaces; geometrices; Euclidean geometry; non-Euclidean geometry; projective geometry; selected topics from the calculus. (Supplementary topics may include metric spaces, matrices, and number theory.) Prereq.: Permission of Department Chairman. A minimum of 15 hours per week for 6 weeks; 6 cr. (Offered in Summer Session only.)

61-62. HIGHER ALGEBRA. The integers, the rational, real and complex numbers systems, congruences, theory of polynomial equations, theory of groups, vector spaces and transformations, matrices and determinants, rings, integral domains, fields, ideal theory, lattices, and Boolean algebras. Prereq.: Math. 17, 23, or 10. 3 rec.; 3 cr.

65-66. ADVANCED CALCULUS. Functions of several variables, continuity, limits; partial differentiation; multiple, line and surface integrals; uniform convergence; improper integrals; Gamma and Beta functions; Fourier series and integral; Stieltjes integral; Laplace transform. Prereq.: Math. 19. 3 rec.; 3 cr. (Will not be offered after 1960-1961.)

67-68. ANALYSIS I, II. The real number system; basic concepts of point set theory; functions of one real variable; limits and continuity; properties of continuous functions; the derivative; mean-value theorems; the Riemann integral; the Riemann-Stieltjes integral; functions of several real variables; partial differentiation; transformations and mappings; implicit functions theorems; multiple Reimann integrals; line and surface integrals. Prereq.: Math. 10 or 24. 4 rec.; 4 cr. (Not offered in 1958-1959.)

71. METHODS OF ADVANCED CALCULUS III. Matrix theory; tensor analysis; complex variables and their applications; conformal mapping; introduction to integral equations. Prereq.: Math. 51-52. 3 rec.; 3 cr. (Not offered 1958-1959.)

83. INTRODUCTION TO DIFFERENTIAL GEOMETRY. A first course in differential geometry. Prereq.: Math. 20, 52, or 68. 3 rec.; 3 cr.

84. INTRODUCTION TO TOPOLOGY. A first course in topology. Prereq.: Math. 48 or 68. 3 rec.; 3 cr.

85-86. THEORY OF FUNCTIONS. An introductory course in the theory of both functions of a real variable and functions of a complex variable. Topics covered will include the real and complex numbers, elements of point set theory, various classes of functions and their properties, Riemann integral; analytic functions, Cauchy theorem, infinite series, residues, contour integration, existence theorems in differential equations. Prereq.: Math. 20. 3 rec.; 3 cr. (Will not be offered after 1960-1961.)

87-88. ANALYSIS III, IV. Further concepts of point set theory; real sequences; infinite series; uniform convergence; improper integrals; the Gamma function; advanced theory of Riemann-Stieltjes integration; Fourier series and orthogonal functions; Fourier integral; complex numbers; analytic functions; the complex integral calculus; Cauchy's integral theorem; Taylor series; singularities; Laurent series; introduction to conformal mapping. Prereq.: Math. 67-68. 4 rec.; 4 cr. (Not offered in 1958-1959.)

91. MATHEMATICS-EDUCATION. (MATH-ED.) The aims and values of secondary-school mathematics; the recommendations of the national committee on mathematics requirements; the State Board requirements; the subject matter and the sequence in which it should be presented in both junior and senior high school; techniques and instructional aids used in teaching secondary-school mathematics; errors, testing program, remedial teaching. Students preparing to teach mathematics in high school should register for this course; it is a prerequisite for Supervised Teaching in Mathematics. Lectures, assigned readings, and discussion. Prereq.: Ed. 58 and Math. 16, 22, or 10. 3 rec.; 3 cr. *(May be counted as major credit only by students preparing to teach mathematics in the secondary schools.)*

93. HIGHER ALGEBRA. Reducibility and decomposition of vector spaces. Invariant subspaces; orthogonality; Hermitian and normal transformations. Canonical forms and similarity of matrices. Introduction to linear algebras. Prereq.: Math. 62. 3 rec.; 3 cr.

96. INTRODUCTION TO THE THEORY OF DIFFERENTIAL EQUATIONS. Existence and uniqueness theorems for ordinary differential equations; theory of linear ordinary differential equations of order n; oscillation and comparison theorems for second order linear ordinary differential equations; introduction to nonlinear ordinary differential equations; first order partial differential equatons; linear partial differential equations of the second order. Prereq.: Math. 87. 3 rec.; 3 cr. (Not offered in 1958-1959.)

MECHANICAL ENGINEERING

EDWARD T. DONOVAN, *Professor;* E. HOWARD STOLWORTHY, *Professor;* TENHO S. KAUPPINEN, *Associate Professor;* WILLIAM E. CLARK, *Assistant Professor;* LEONARD A. FISHER, *Assistant Professor;* RUSSELL L. VALENTINE, *Assistant Professor;* DAVIS P. WURTS, *Assistant Professor;* KARL S. WEBSTER, *Assistant Professor;* ELIAS M. O'CONNELL, *Instructor;* HARVARD B. EMERY, *Instructor;* ROBERT W. CORELL, *Instructor;* LYMAN J. BATCHELDER, *Instructor Emeritus;* JOHN C. TONKIN, *Instructor Emeritus*

3. MACHINE DRAWING. Application of the principles of engineering dawing to machine parts. Various pictorial systems as an aid in sketching. Reproduction methods and modern drafting room organizations. Commercial drafting room methods in sketching machine parts, drawing from sketches, and making tracings. Mr. Clark and Mr. O'Connell. Prereq.: M.E. 1. 2 lab.; 2 cr. (Not offered after 1958-1959.)

4. KINEMATICS. Motion in machine construction; belts and other flexible connectors; gear and gear teeth; wheels in trains; epicyclic trains; cams; instantaneous centers; linkwork, velocity, and acceleration diagrams. Mr. Kauppinen, Mr. Clark, and Mr. Wurts. Prereq.: M.E. 2 and Math. 16. 1 rec.; 2 lab.; 3 cr. (Not offered after 1958-1959.)

7-8. Mechanics. A study of forces and moments of forces; determination of stresses in trusses and frames; centroids and centers of gravity; rectilinear and curvilinear motion; translation and rotation of bodies; work, power, impulse, momentum, and energy. The application of mechanics to the determination of stress and strain in rigid bodies. The study of thin-walled cylinders, riveted joints, torsion, transverse loading of beams, deflection in beams of all kinds, study of columns, compound stresses as applied to design of machine parts. Mr. Kauppinen and Mr. Clark. Prereq.: Math. 17 and Phys. 21. 4 rec.; 4 cr. (Not offered after 1959-1960.)

9-10. Mechanics. Similar to M.E. 7-8, but with those portions having application to the design of machine parts omitted. For juniors in Civil and Electrical Engineering. Mr. Kauppinen, Mr. Clark, and Mr. Wurts. Prereq.: Math. 17 and Phys. 21. M.E. 9: 3 rec.; 3 cr. M.E. 10: 3 rec.; 1 lab.; 4 cr. or 3 rec.; 3 cr. (Not offered after 1959-1960.)

11, 12. Manufacturing Processes. A study of methods used in the shaping, forming, and joining of metals and other engineering materials, including demonstration and practice in the use of machine tools and metal-forming equipment. Mr. Clark and Mr. O'Connell. 2 lab.; 2 cr. (Not offered after 1958-1959.)

13-14. Engineering Drawing. Representation of engineering information by multiview drawings, pictorial views, sketches, and graphs. Mr. Kauppinen, Mr. O'Connell, and Mr. Emery. 1 lab.; 1 cr.

15-16. Machine Design. Application of the principles of mechanics to the design of machine elements, with the idea of manufacturing the parts in the most economical manner in the shops. General principles of design will be followed rather than the development of any particular system of procedure. Mr. Kauppinen and Mr. Clark. Prereq.: M.E. 8. 3 lab.; 3 cr. (Not offered after 1960-1961.)

19, 20. Mechanical Engineering Materials. The properties, uses, and treatment of ferrous and non-ferrous metals and alloys, plastics, etc., including work in the testing of materials. Prereq.: M.E. 7-8 taken concurrently. M.E. 19: 2 rec.; 1 lab.; 3 cr. M.E. 20: 2 lab.; 2 cr. (Not offered after 1959-1960.)

17-18. Manufacturing Processes and Design. The design, manufacture, and fabrication of industrial tools and machines. Drawings are prepared and parts are produced and assembled from these drawings. Prereq.: M.E. 14. 3 lab.; 3 cr. (Not offered before 1959-1960.)

21. Heat Power Engineering. The fundamental theory of engineering themodynamics and its applications to steam power plant and internal combustion equipment. For students in Civil Engineering. Mr. Donovan and Mr. Fisher. Prereq.: Math. 17 and Phys. 21. 3 rec.; 3 cr. (Not offered after 1959-1960.)

23-24. Thermodynamics. The fundamental laws of thermodynamics and their relation to the operation of mechanisms using gases and vapors as their working substances. Mr. Donovan, Mr. Stolworthy, and Mr. Valentine. Prereq.: Math. 17 and Phys. 21. 3 rec.; 3 cr. (Not offered after 1959-1960.)

25. Statics. Analytical and graphical methods of determining forces in rigid bodies in equilibrium; properties of areas and bodies. Prereq.: Math. 22, Phys. 18. 2 rec.; 2 cr. (Not offered before 1959-1960.)

26. **Dynamics.** Kinematics, kinetics, and introduction to vibrations of mechanical systems. Prereq.: M.E. 25. Prereq. or concurrent: Math. 24. 3 rec.; 3 cr. (Not offered before 1959-1960.)

27-28. **Mechanical Laboratory.** The apparatus and methods of testing power plant operation and equipment. Mr. Donovan, Mr. Valentine, and Mr. Corell. Concurrent requirement: M.E. 23-24. 1 lab.; 1 cr. (Not offered after 1959-1960.)

29-30. **Mechanical Laboratory.** Methods of investigating operation and testing of power plant equipment. Mr. Donovan, Mr. Valentine, Mr. Fisher, and Mr. Corell. Concurrent requirement: M.E. 23-24. 2 lab.; 2 cr. (Not offered after 1959-1960.)

31, (31). **Forging and Welding.** Advanced work in forging and welding metals. A continuation of the work of M.E. 11 and 12 with some opportunity being provided for practice in forging and gas and electric welding. Mr. O'Connell. Prereq.: M.E. 11, 12. 2 lab.; 2 cr.

32, (32). **Machine Shop Practice.** Advanced work in the study of machine tools and their use, production methods, inspection, and control. Mr. Clark. Prereq.: M.E. 11, 12. 2 lab.; 2 cr.

33, (33). **Thermodynamics.** The fundamental laws of thermodynamics and their relation to working substances. Prereq. or concurrent: Phys. 24. 3 rec.; 3 cr. (Not offered before 1960-1961.)

34, (34). **Thermodynamics.** A more comprehensive study of thermodynamic properties of media; fundamentals of combustion; heat transfer. Prereq.: M.E. 33. (Not offered before 1960-1961.)

35, (35). **Strength of Materials.** Stresses and strains in structural and machine elements. Prereq.: M.E. 25. 3 rec.; 3 cr. (Not offered before 1960-1961.)

36. **Fluid Mechanics.** Fundamentals and phenomena of the flow of compressible and incompressible fluids. Fluid properties, fluid statics and kinetics, energy transfer, dimensional analysis and similitude. Prereq.: M.E. 26, 33. 3 rec.; 3 cr. (Not offered before 1960-1961.)

37. **Mechanical Laboratory.** Study and instrumentation of mechanical engineering equipment. Prereq. or concurrent: M.E. 33. 1 lab.; 1 cr. (Not offered before 1960-1961.)

38. **Mechanical Laboratory.** Investigation of the operating characteristics of mechanical equipment and heat exchangers; preparation of engineering reports. Prereq.: M.E. 37. Prereq. or concurrent: M.E. 34, 36. 2 lab.; 2 cr. (Not offered before 1960-1961.)

39. **Engineering Materials.** The structure, properties, and treatment of ferrous and non-ferrous metals and alloys, plastics, and other non-metallic materials. Prereq. or concurrent: M.E. 35. 2 rec.; 1 lab.; 3 cr. (Not offered before 1961-1962.)

40. **Heating and Air Conditioning.** Present methods of heating and ventilating buildings. Mr. Stolworthy and Mr. Fisher. Prereq.: Hotel Ad. 26. 2 rec.; 1 lab.; 3 cr.

41-42. **Mechanical Engineering Seminar.** Student reports and discussions of recent developments in mechanical engineering. Prereq.: Senior standing. 1 rec.; 1 cr. (Not offered before 1961-1962.)

43-44. MACHINE DESIGN AND ANALYSIS. Analysis and design of mechanical elements and systems, utilizing and developing further the fundamentals of strength of materials and dynamics. Prereq.: M.E. 26, 35, Math. 24. 3 rec.; 3 cr. (Not offered before 1961-1962.)

49. THESIS. An investigation or research of some mechanical engineering problem. Elective for seniors in Mechanical Engineering. Prereq.: Permission of the Department. 2 cr.

51. MECHANICAL LABORATORY. Performance studies of steam engines and turbines, nozzles, and condensers. Application of the laws of thermodynamics to steam power plant equipment. Mr. Donovan, Mr. Valentine, and Mr. Fisher. 2 lab.; 2 cr. (Not offered after 1960-1961.)

53-54. POWER PLANTS. A study of the steam generating power plant dealing with its equipment and costs. For students in Mechanical Engineering. Mr. Donovan and Mr. Stolworthy. Prereq.: M.E. 24. M.E. 53: 2 rec.; 2 cr. M.E. 54: 1 rec.; 2 lab.; 3 cr. (Not offered after 1960-1961)

55-56. INTERNAL COMBUSTION ENGINE. Thermodynamics applied to spark ignition and compression ignition engines and gas turbines. Fuels, carburetion, fuel injection, combustion chambers, lubrication, cooling, and performance, Mr. Stolworthy and Mr. Fisher. Prereq.: M.E. 24. 2 rec.; 1 lab.; 3 cr. (Not offered after 1960-1961.)

57-58. HEAT AND POWER SYSTEMS. Analysis and solution of heat and power system problems, utilizing and developing further the fundamentals of thermodynamics, fluid flow, combustion, and heat transfer. Prereq.: M.E. 34, 36, and 38. 3 rec.; 1 lab.; 4 cr. (Not offered before 1961-1962.)

59, 60, 61, 62. MECHANICAL ENGINEERING SEMINAR. Preparation and presentation of addresses on mechanical engineering topics by students, and criticism by instructor of delivery, subject matter, and terms used. Required of juniors and seniors in Mechanical Engineering. Mr. Valentine. ½ cr. (M.E. 59, 60 not offered after 1959-1960; M.E. 61, 62 not offered after 1960-1961.)

65. ENGINEERING ECONOMY. The principles which form the basis of engineering procedures for obtaining the highest ratio of utility to cost. Mr. Donovan. Prereq.: Senior standing. 3 rec.; 3 cr.

66. INDUSTRIAL MANAGEMENT. Principles and methods of industrial management, designed to give students a working knowledge of modern industrial practice, with particular emphasis on the engineering viewpoint. Prereq.: Senior standing. Mr. Plaisted. 3 rec.; 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

MUSIC

Karl H. Bratton, *Professor;* Robert W. Manton, *Professor;* Donald E. Steele, *Associate Professor;* Irving D. Bartley, *Assistant Professor;* David M. Smith, *Assistant Professor;* Allan Owen, *Assistant Professor;* Vincent Bleecker, *Assistant Professor;* Luca DiCecco, *Instructor;* John W. Wicks, *Instructor;* Meredyth Manns, *Instructor*

Music Organizations

Registration for musical organization courses should be completed during the registration period. These courses cannot be used to satisfy major requirements except in the Music-Education Curriculum. *Students may register either for audit or for credit but each participant must be registered.*

1, (1). University Band. Open to all students on basis of individual tryouts. The University Band includes both the varsity football band and concert band. The band gives concerts during the college year, and also furnishes music for football games. Students enrolling for concert band work only will be expected to begin their work on November 18, 1958. Mr. Owen. Prereq.: Permission of instructor. 2 lab.; ½ cr.

2, (2). University Symphony Orchestra. Open to all students and others on basis of individual tryouts. The orchestra gives several concerts during the year and also accompanies the vocal groups and solo instrumentalists on various occasions. Membership includes students, faculty, and members of the surrounding communities. Mr. Bleecker. Prereq.: Permission of instructor. 2 lab.; ½ cr.

3W, (3W). Women's Glee Club. Open to all students interested in singing who fulfill the requirements of a tryout. Recommended for all women voice majors. Miss Manns. Prereq.: Permission of the instructor. 2 lab.; ½ cr.

3M, (3M). Men's Glee Club. Open to all students interested in singing who fulfill the requirements of a tryout. Recommended for all men voice majors. Mr. Wicks. Prereq.: Permission of the instructor. 2 lab.; ½ cr.

5, (5). University Concert Choir. An advanced choral group devoted to the study and performance of the best classical and modern choral literature. Recommended for men and women voice majors. Mr. Bratton. Prereq.: Permission of instructor. 2 lab.; ½ cr.

6, (6). R.O.T.C. Band. Open only to freshman and sophomore men enrolled in the R.O.T.C. program, on basis of individual tryouts. This band furnishes music for all military functions, and other University activities when needed. Mr. Owen. Prereq.: Permssion of instructor. 2 lab.; ½ cr.

7, (7). Ensemble. Small groups of instrumentalists and vocalists organized to provide advanced students experience in such groups as the madrigal singers, quartets (string, brass, woodwind, voice), and other combinations. Prereq.: Permission of the instructor. 2 lab.; ½ cr.

Music majors may count a maximum of 8 credits earned in music organizations toward graduation. Students earning credit in R.O.T.C. Band may count a maximum of 6 credits toward graduation including band credit. Any other student may count not more than 4 credits toward graduation.

Applied Music

Register for the following courses as Mus. 23, etc.

Lessons in Applied Music are based on ½-hour private instruction per week. One semester hour of credit may be earned with one lesson per week; two semester hours of credit may be earned with two lessons per week. Five one-hour practice periods will be sought out by the music students themselves. The special semester fee for Applied Music is $25 for one lesson a week, and $50 for two lessons a week. These fees include the use of a practice room for the required preparations.

Majors in Applied Music are required to present 16 semester hours in applied music taken over a period of four years. Two lessons per week are required each semester. Four semester credits taken in the freshman year are regarded as prerequisite to the Applied Music option.

Registration in Applied Music courses is open to all students in the University, subject to approval by the instructor. A student may register for credit in the same course in successive semesters.

†23, (23). Piano. The methods of presentation and the material used vary with each pupil and his degree of advancement. With beginners, training is given in the fundamentals of pianoforte technique and in the reading of keyboard music. As early as is practicable, emphasis is placed on musical values, musicianship, and sound piano technique. For this purpose, the literature employed is selected from the masters. Musical understanding is developed and quality of performance is stressed. With the attainment of advanced technique, the student's repertory is broadened to include works of all periods of literature: pre-Bach, J. S. Bach, C. P. E. Bach, Scarlatti, Haydn, Mozart, Beethoven, the romantic composers, the post-romantic, and present-day composers. Mr. Steele, Mr. Bartley, Mr. Wicks, and Mr. DiCecco. 1 or 2 lessons; 1 or 2 cr.

†24, (24). Organ. This course embraces a thorough foundation in pedal and manual technique including hymn playing, followed in subsequent semesters by the standard works of Bach, Cesar Franck, Widor, and contemporary composers. Students should be proficient in piano before enrolling for organ. Permission of the instructor is required. Mr. Bartley. 1 or 2 lessons; 1 or 2 cr.

†25, (25). Violin, Viola. The choice of literature and method in violin teaching depends entirely on the individual pupil's background and ability, therefore no single course of study is set up as a requirement for all pupils. Emphasis is placed primarily on musicianship and musical values, and the development of a sound, reliable technique is a means to that end. Technique is developed in these lessons not so much through exercise and drill as it is through the best in literature. Mr. Bleecker. 1 or 2 lessons; 1 or 2 cr.

†26, (26). Voice. Instruction in voice will seek to develop those qualities which are essential for intelligent interpretations, such as correct posture, breathing, pure tone, reasonance, clear enunciation, and technical facility. Each voice is given the treatment best suited to its individual needs. A higher ideal than the perfection of mere mechanical skill is sought, namely a musi-

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† Students majoring in Music or enrolled in the Music-Education Curriculum are required to attend all student and faculty recitals as a part of the assigned work of their programs.

cianly style of singing and a thorough appreciation of the best works of the masters, both classic and modern. Mr. Bratton and Miss Manns. 1 or 2 lessons; 1 or 2 cr.

†27, (27). VIOLONCELLO, STRINGBASS. Since the literature for these instruments is somewhat more limited than that written for the violin, students are encouraged to arrange and transcribe material for their own use. Both the orchestral and solo literature for these instruments are studied, and the possibilities of the string bass as a solo instrument is thoroughly explored. The basic beginners' method for cello is Dotzauer and for the bass is Simandl. The cello literature includes sonatas of Corelli, Franck, Grieg, Bach, etc., and concertos by Goltermann, Saint-Saens, Haydn, etc. Mr. DiCecco. 1 or 2 lessons; 1 or 2 cr.

†28, (28). WOODWIND. Courses in the technique and literature of clarinet, flute, oboe, bassoon, and saxophone or any woodwind instrument are given. Mr. Owen. 1 or 2 lessons. 1 or 2 cr.

†29, (29). BRASS. Instruction is offered for any of the following instruments: trumpet, trombone, French horn, baritone, and tuba, or any brass instrument. Correct tone production, articulation, and musical interpretation are stressed. Mr. Smith. 1 or 2 lessons; 1 or 2 cr.

†30, (30). PERCUSSION. The study of the snare drum rudiments. The technique, tuning, and sticking of the pedal and hand timpani. Cymbals and all other percussion effects (claves, maracas, triangle, tambourine, wood-block, chimes, etc.). The playing of the glockenspiel, bells, or bell lyra, as well as xylophone is offered under this classification. Mr. Smith. 1 or 2 lessons; 1 or 2 cr.

Theory and Composition

*†9-10. SIGHTSINGING, EAR TRAINING, DICTATION I. A course designed to provide intensive training in the acquisition of the basic essentials of music. Special emphasis is placed upon development of rhythmical sense, the identification and singing of intervals, accurate response to melodic, harmonic, and rhythmical dictation, the basic laws of musical notation, knowledge of scales, and terminology. Mr. DiCecco and Mr. Bartley. 3 labs.; 0 cr.

†11-12. HARMONY I. The basic triads and their inversions, the complete seventh family and their inversions, also the introduction of suspensions, passing notes, changing notes, and the various types of appoggiaturas. The work consists of written exercises (both figured and unfigured) and the harmonization of given melodies in three and four parts. One session each week will be devoted to keyboard harmony. Formal analysis of Bach chorales and the ability to approximate this harmonic-linear style in the student's own work will be the ultimate goal. Mr. Bartley. Prereq.: Familiarity with scales and keys with ability to read simple music at the piano, Mus. 9-10. 3 rec.; 2 cr.

†13-14. SIGHTSINGING, EAR TRAINING, DICTATION II. An extension of Music 9-10. Further training in basic elements of music. Continued emphasis on the

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* Mus. 9-10 is normally prerequisite to Mus. 11-12, but the two may be taken simultaneously with the approval of the instructor in Mus. 11-12. Qualified students are exempted from Mus. 9-10 when proper notification is furnished the College Dean's Office and the University Recorder.

† Students majoring in Music or enrolled in the Music-Education Curriculum are required to attend all student and faculty recitals as a part of the assigned work of their programs.

rhythmical and melodic phenomena of the art, development of acuity and accuracy in perception and response. Mr. DiCecco and Mr. Bartley. Prereq.: Mus. 9-10. 3 lab.; 1 cr.

†15-16. HARMONY II. Continuation of secondary seventh chords and inversions; continuation of non-harmonic tones, especially chromatic, of "borrowed" dominants and modulation; the use of 9th and 11th chords; chromatic alteration, including augmented sixth chords, Neapolitan sixth; continuation of formal analysis; introduction to contemporary harmonic practice. Harmonic analysis and keyboard harmony will be taught concurrently with written harmony throughout the year. Stress will be laid on modulation and on chromatic alteration. Mr. Bleecker. Prereq.: Mus. 11-12. 3 rec.; 2 cr.

†41-42. PRINCIPLES OF CONDUCTING. The development of conducting — physical aspects, equipment of conductor, fundamental gestures and beats, baton techniques. The reading and analysis of full and condensed scores. Study of essential choral conducting techniques, problems of choral organization, psychology of rehearsal. Mr. Bleecker. 2 rec.; 1 cr.

†51-52. CANON AND FUGUE. This seminar course will include free counterpoint in three and four parts, double counterpoint, the writing of simple two-part inventions, choral preludes, etc. The canonic and fugal studies will be based largely upon the works of Bach and will have as their objective the composition of a two-, a three-, and a four-voiced fugue. Mr. Manton. Prereq.: Mus. 15-16 or permission of instructor. 2 rec.; 2 cr.

†57-58. COUNTERPOINT. The first semester will be devoted to 16th century polyphony based on the sacred choral style of Palestrina, Vittoria, and others of this period. The second semester takes up free instrumental counterpoint based on the styles of Bach, Handel, and other classic masters. Twentieth century counterpoint will be discussed in the closing classes of the course. Mr. Manton. Prereq.: Mus. 11-12 or permission of instructor. 2 rec.; 2 cr.

†71-72. COMPOSITION. Form is the foundation, the skeleton, and support to imagination and expression in music. Through a study of form the student, in creating, learns to control his media of expression. The various harmonic forms, the variation, the rondo, and the sonata forms will, in turn, serve as models for composition. Mr. Manton. Prereq.: Permission of the instructor. 2 rec.; 2 cr.

†97-98. ORCHESTRATION. This course offers the study of instruments and methods of combining them into coherent arrangements arriving at successful balances for the band and orchestral arranger. The characteristics, range, and tone quality of the instruments are fully covered and transcriptions are made. Orchestral effects from the pens of the greatest composers are studied. Chorestration is offered during the latter part of the second semester. The techniques of writing for solo voices, for mixed voices, men's and women's voices, are taken up through the medium of arrangements, and original work. Mr. Manton. Prereq.: Permission of the instructor. 2 rec.; 2 cr.

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History, Literature, and Appreciation

†37-38. Introduction to Music Literature. A listener's approach to music history. The evolution of ideas in sound, texture, and structure from the Middle Ages to the present, with special attention to the music of Des Prez, Palestrina, Vittoria, Byrd, Purcell, Monteverdi, Bach, Handel, Haydn, Mozart, Beethoven, Schubert, and Brahms, together with many others. Emphasis will be placed on the listener's acquiring a discerning ear as well as a broad historical perspective of the music of our Western civilization. Mr. Wicks and Mr. DiCecco. 3 rec.; 3 cr.

†43. Survey of Music in America. A survey of the development of music in the United States from Colonial times to the present. The various influences such as the English tradition, the German era, the French impressionistic influence, and finally the quest for an American style will be presented and discussed together with the music of the most representative composers. Mr. Manton. 2 rec.; 2 cr.

†47, 48. Survey of Pianoforte Literature. A course which covers through lecture and demonstration, the history and development of keyboard literature from Bach to the present. A discussion and performance of the works of Bach, the sonatas and concertos of Haydn, Mozart, Beethoven, Schubert, the Romantic composers, and of contemporary writers. Mr. Steele. 2 rec.; 2 cr.

†80. Twentieth-Century Music. A study of the music of the 20th century, including its literature, its trends, and an analysis of techniques, styles, forms, and expressions. Mr. Steele. 2 rec.; 2 cr.

†(83). The Life and Works of Beethoven. This course will include a study of the piano sonatas, symphonic works, and the string quartets of Beethoven. Lectures, analysis, reports, required readings, and listening will constitute the techniques of presenting the course. Mr. Manton. 2 rec.; 2 cr.

†87, 88. Survey of Opera and Oratorio. A survey of the oratorio and the opera beginning in Italy in the 16th century and culminating in modern opera and oratorio. This includes comic, grand, and romantic opera, and composers such as Handel, Mozart, Verdi, Puccini, Wagner, and Richard Strauss. The development of the recitative and aria, styles, and trends will be discussed. Oratorio is stressed in the first semester; opera in the second. Miss Manns. 2 rec.; 2 cr.

Music Education

The Department of Music offers a four-year curriculum for teachers of elementary and secondary school music. (See Music-Education curriculum.)

Register for the following courses as Mu.-Ed. 90, etc.

†90. Problems in the Teaching of Elementary School Music. Aims, scope, and organization of materials and activities in the elementary schools in keeping with modern trends in educational philosophy. Particular attention will be given to the child voice, its care and development. A thorough study and demonstration of materials and methods for the various grades will be

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made. Observations of elementary school music. Mr. Smith. Prereq.: Educ. 58. 3 rec.; 3 cr. (*Formerly Mu.-Ed. 91.*)

†93. PROBLEMS IN THE TEACHING OF SECONDARY SCHOOL MUSIC. The application of educational principles to the teaching and learning of music, and the organization of the music curriculum on the junior and senior high-school levels. Consideration is given to the adolescent voice and the classification of voices; the selection of vocal and instrumental materials to fit the needs of the individual group, in order to insure the maximum growth and musical development of the students; and the building of unified concert programs. A discussion of problems of administration and management, and the relationship of the teacher to school and community. Observation of music programs in secondary schools. Mr. Smith. Prereq.: Educ. 58. 3 rec.; 1 lab.; 3 cr. (*Formerly Mu.-Ed. 92.*)

†95. TECHNIQUES AND METHODS IN STRINGED INSTRUMENTS. A demonstration course in class-teaching of stringed instruments designed to simulate classroom situations and methods as far as possible. Mr. Bleecker. 2 rec.; 2 cr.

†(96). TECHNIQUES AND METHODS IN WOODWIND INSTRUMENTS. A study of correct tone production and technique of woodwind instruments. Materials and procedures for class and individual instruction will be emphasized. Consideration will be given to the school band as a concert organization. Mr. Owen. 2 rec.; 2 cr. (*This is a first semester course.*)

†97. TECHNIQUES AND METHODS IN BRASS AND PERCUSSION INSTRUMENTS. A study of correct tone production and technique of brass instruments and of rudimentary percussion technique. Materials and procedures for class instruction will be emphasized. Mr. Smith. 2 rec.; 2 cr.

NATURE STUDY

(*See Biology, Botany, Forestry, and Zoology*)

NURSING

(*See Nursing Curriculum*)

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DESCRIPTION OF COURSES

OCCUPATIONAL THERAPY

(See The Arts)

These courses are for students in the Occupational Therapy curriculum; elective for others by permission of the Department Chairman.

Register for the following courses as O.T. 1, etc.

1. CRAFTS. Basic instruction in bookbinding, stenciling, silk screening, sewing, embroidery, knitting and crocheting, emphasizing the therapeutic application of these modalities. Mrs. Talbot. 2 lab.; 2 cr.

2. CRAFTS. A basic course in crafts such as seat weaving, basketry, chip carving, fly tying, and leatherwork. The therapeutic application of these crafts is stressed. Mrs. Talbot. 3 lab.; 3 cr.

(5). JEWELRY AND METALWORK. Basic instruction in design and construction, using copper, silver, and pewter. Etching, tooling, casting, enameling and stone setting are included. Miss Clark. 3 lab.; 3 cr.

(6). WEAVING. Card weaving, small frame work, and hand and foot-powered loom weaving applied to occupational therapy. Miss Henderson. 3 lab.; 3 cr.

7-8 ELEMENTARY PROCESSES IN WOOD AND PLASTICS. A basic course in the design and construction of wood and plastic objects, including study of the nature and properties of these materials and the processes of cutting, shaping, fitting, and finishing. Practice and demonstrations cover the operation of hand and power tools, safety precautions, the making of adaptive equipment, and other problems of shop management to be encountered in Occupational Therapy. Mr. Brett and Mrs. Talbot. 1 rec.; 2 lab.; 2 cr.

(10). LETTERING AND PRINTING. Basic instruction in various styles of lettering with pen, and with brush; poster design; operation of hand and pedal manipulated presses, with elementary layout, composition with type, and proof-reading. Survey and history of lettering and print methods. Mrs. Talbot and Mr. O'Reilly. 1 rec.; 2 lab.; 2 cr.

15-16. CERAMICS AND MODELING. Design and construction. Methods of preparing and working clay, and uses of pottery equipment best suited to application in occupational therapy work. Mr. Scheier. 1 rec.; 2 lab.; 2 cr.

41. THEORY OF OCCUPATIONAL THERAPY. This course is designed to orient the student to occupatitonal therapy as a profession. Ten hours of instruction in setting up a small hospital library is included. Instruction trips to hospitals and treatment centers. Miss Henderson and Mr. Pritchard. 2 lec. or rec.; 2 cr.

42. THEORY OF OCCUPATIONAL THERAPY. This course is composed of these units of study: organization and administration of the hospital and the occupational therapy department, recreation as a therapeutic medium, application of the principles of occupational therapy to pediatrics, geriatrics, sensory disturbances, and mental deficiency. Instruction trips to hospitals and treatment centers. Miss Henderson. Prereq.: O. T. 41. 2 lec. or rec.; 2 cr.

44. THEORY OF OCCUPATIONAL THERAPY. Application of the principles of occupational therapy to general medical and surgical conditions, tuberculosis, cardiac disturbances, and psychiatry. Instruction trips to hospitals and treatment centers. Miss Henderson and visiting lecturers. Prereq.: O. T. 42. 2 lec. or rec.; 2 cr.

46. Theory of Occupational Therapy. Application of occupational therapy techniques used in treating patients with physical disabilities. Special consideration is given to cerebral palsy, poliomyelitis and the degenerative neurological conditions. Instruction trips arranged. Miss Henderson. Prereq.: O. T. 44. 2 lec.; 1 lab.; 3 cr.

49, 50. Clinical Subjects. Basic information concerning the etiology, pathology, symptoms, and treatments of disease. Visiting specialists lecture on general medicine and surgery, psychiatry, orthopedics, pediatrics, ophthalmology, and otology. Prereq.: Zool. 17-18, or 17-20, O.T. 41, 42, and O.T. 44. (O.T. 44 may be taken concurrently.) one 2 hr. lec.; 1 rec. or instruction trip; 2 cr. (Alternate years; offered 1958-1959.)

PHILOSOPHY

Robert W. Jordan, *Associate Professor;* Donald C. Babcock, *Professor Emeritus*

1, 2. History of Philosophy. A general introduction to the history of Western philosophy, covering the major figures from the Pre-Socratic philosophers to Hegel. The aim of this course is to make the student familiar with the main outlines of the most significant and influential achievements in Western philosophic thought. Particular attention will be given, in the first semester, to Socrates, Plato, and Aristotle, and, in the second semester, to Descartes, Spinoza, Locke, Berkeley, Hume and Kant. Mr. Jordan. (Not open to freshmen.) 3 lec. or rec.; 3 cr.

3. Logic. An introduction to the principles of clear meaning and valid inference and their application in ordinary discourse and in scientific and philosophic thought. The nature and classification of terms and propositions. The nature of deductive and inductive argument and the recognition of fallacies. Particular emphasis will be given to syllogistic arguments in ordinary language, but an introductory treatment of symbolic notation and method will be included. Considerable attention will be given to the connection between logic and the related disciplines of epistemology and metaphysics and to the function of logic as a universal instrument of knowledge. Mr. Jordan. Not open to freshmen. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

(8). Philosophy of Human Nature. An introduction to philosophy through the systematic study of the nature of man and of those problems which are particulary relevant to human decision and conduct. The point of departure will be the Greek-Christian philosophy of man represented by the philosophy of classical realism. especially individual and social ethics. Various alternative theories of human nature such as those of positivism. Freudism, and evolutionary naturalism will also be considered. Readings in both classical and contemporary literature. Mr. Jordan. Not open to freshmen. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

54. Philosophy of Religion. This course has two main objectives: (1) To examine the nature of religious experience and the rational grounds which make that experience a proper concern of philosophic inquiry. The traditional problems of the philosophy of religion will be discussed — the existence of God, the attributes of God, the nature of faith, mysticism, the

problem of evil, the immortality of the soul. (2) To consider the basis of a defense of the religious understanding of the universe against the prevailing secularism and naturalism of the contemporary world. Readings will emphasize the theistic position of classical Christian thought, but some attention will also be given to Eastern philosophies of religion. Imporant contemporary writers will be considered. Mr. Jordan. Prereq.: One semester of philosophy or religion or permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

57. Types of Ethical Theory. An introduction to the problems of moral philosophy through a critical survey of the principal traditional and contemporary ethical theories. The topics to be discussed include Classical and Hellenistic Greek ethics, Christian ethics, Kantianism, Marxism, Utilitarianism, Emotive theories, Existentialism, and the revival of Natural Law. Particular attention will be given to the relation of ethical theory to other aspects of philosophy such as metaphysics and epistemology, and to the relation of ethics to psychology and sociology. Mr. Jordan. Prereq.: One semester of philosophy or suitable background in the social sciences with permission of the instructor. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

61. Plato. A systematic study of Plato's philosophy of human nature as revealed in his teaching on the nature of art, politics, individual ethics and psychology, and education. This course is concerned, primarily, with the practical aspects of Plato's philosophy. Readings from the *Dialogues* will emphasize the *Republic* and the early and comparatively non-technical writings of Plato, but will include some selections from the later writings. The aim throughout will be to exhibit not only the historical but also, and especially, the contemporary significance of Plato's philosophy. Mr. Jordan. Prereq.: One semester of philosophy. Juniors and seniors who have concentrated in the classics may be admitted to this course without previous courses in philosophy by permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

(63). Contemporary Philosophy. A survey of the most important men and movements in the recent and contemporary philosophic thought of Europe and America. The principal topics considered will be Materialism and Positivism, Idealism, Vitalism and Pragmatism, Phenomenology, Existentialism, and the recent revival of Classical Realism. Particular attention will be given to Existentialism. Attention will also be given, wherever possible, to the interrelation of philosophical ideas and contemporary trends in art, literature, and criticism. Mr. Jordan. Prereq.: One semester of philosophy; Phil. 1, 2 is recommended. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

64. Mediaeval Philosophy. The philosophy of the Middle Ages from St. Augustine to St. Thomas Aquinas. An examination of the mediaeval synthesis of Greek philosophy and Christian doctrine. The main emphasis will be placed on the two major conceptions of nature, man, and God represented by the Augustinian and Thomistic traditions. Readings will be mainly in Augustine and Aquinas, but attention will also be given to other writers, including Boethius, Erigena, Anselm, Abelard, and Bonaventure. The contributions of Arabian and Jewish philosophers will also be discussed. Mr. Jordan. Prereq.: One semester of philosophy or adequate preparation in the history of the Middle Ages with permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

65. Aesthetics. An introduction to the philosophy of art. This course has three aims: (1) to examine the important classical and contemporary theories of art, such as formalism, expressionism, contextualism, and the theory of art as craft; (2) to consider the special problems which appear in the domain of aesthetic experience, such as the nature of aesthetic experience, the aesthetic object, the aesthetic attitude, aesthetic meaning, and aesthetic judgment and criticism; (3) to consider the minimum requirements of an adequate theory of the aesthetic in relation to the more general demands of an adequate philosophy. Mr. Jordan. Prereq.: One semester of philosophy or suitable background in psychology, literature, or the arts with permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

67. Seventeenth Century Philosophy. A critical and historical survey of the most important developments in 17th century philosophic thought in Europe and in England. The aim of this course is to examine the important changes underlying the decline of scholasticism and the emergence of the modern mind. Both the empiricist tradition, in Bacon, Hobbes and Locke, and the rationalist tradition of the continent will be considered. The main emphasis, however, will be given to Descartes, Leibniz and Spinoza. Mr. Jordan. Prereq.: One semester of philosophy or suitable preparation in the history or literature of the period with permission of the instructor. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

68. British Empiricism. A critical survey of the leading figures in the British Empiricist tradition. The purpose of this course is to examine the philosophical positions of Locke, Berkeley, and Hume through a detailed and critical study of their own works and to examine the historical significance of this tradition, especially its importance for contemporary thought. Contemporary writers representative of Bitish Empiricism will also be considered. Mr. Jordan. Prereq.: One semester of philosophy; Phil. 1, 2 is recommended. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

(70). Epistemology. A systematic study of the nature of the cognitive act and the conditions which make sensory and rational cognition possible. Theories of knowledge representing classical realism, conceptualism, idealism, and nominalism will be considered in detail. The work of important contemporary philosophers will also be discussed. Readings in Berkeley, Kant, and the contemporary literature of realism, conceptualism, and empiricism. Mr. Jordan. Prereq.: One semester of philosophy; Phil. 1, 2, or 3 is recommended. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

72. Metaphysics. A systematic study of the fundamental concepts of metaphysics such as the nature of being, analogy, the transcendental terms, essence and existence, potency and act, matter and form, substance and accident, causality and change, and the arguments for a First Cause. Special attention will be given to the relation of metaphysics to other philosophic disciplines such as logic and epistemology, theory of value, and philosophy of religion. Particular attention will be given to phenomenology as a part of philosophic method. Contemporary criticism of metaphysics will also be discussed. Mr. Jordan. Prereq.: One semester of philosophy; Phil. 1, 2 is recommended. 3 lec. or rec.; 3 cr. (Not offered 1958-1959.)

PHOTOGRAPHY

(*See The Arts*)

PHYSICAL EDUCATION FOR MEN

Carl Lundholm, *Director and Professor of Physical Education and Athletics;* Paul C. Sweet, *Professor;* Henry C. Swasey, *Associate Professor;* Clarence E. Boston, *Associate Professor;* E. William Olson, *Associate Professor;* Horace S. Martin, Jr., *Assistant Professor;* A. Barr Snively, Jr., *Assistant Professor;* Edward J. Blood, *Assistant Professor;* Andrew Mooradian, *Assistant Professor*

Requirements. Physical Education is required of all freshman men students and first-year students in the Thompson School of Agriculture. Each student must provide himself with an activity suit consisting of gray sleeveless jersey, gray trunks, white woolen socks and rubber-soled tennis or basketball shoes. This suit must be worn at all classes in physical education.

31, 32. Physical Education. Development of the organic system generally; stimulation of the neuromuscular system through physical activity; encouragement of a proper attitude toward play; development of an appreciation of physical activities as worthwhile leisure-time recreation. *Required of freshmen.* 2 periods; ½ cr. Students passing will get grade of cr.

Teacher Preparation Courses

Required of students registered in the Physical Education Teacher Preparation curriculum for Men. Elective for other students who are preparing to teach an academic subject by special permission from the Director of Physical Education and Athletics.

23. Principles of Physical Education. The aims, objectives, and principles of physical education and the historical factors which have influenced the physical life of nations. Mr. Martin. 3 lec.; 3 cr.

45. Football. A history of football with consideration of its educational implications and an analysis of the various systems of play. Instruction in team and individual offensive and defensive fundamentals. The rules, theory, strategy, generalship of team play, and the responsibilities of the coach for the physical welfare of the team. Mr. Boston. 1 rec.; 2 lab.; 2 cr.

46. Baseball. Theoretical and practical consideration of the basic principles of batting and fielding; the fundamentals of each position; special stress on problems involving team play, coaching methods, physical conditioning, and rules; a history of the game with a consideration of its educational values. Mr. Swasey. 1 rec.; 2 lab.; 2 cr.

47. Track and Field Athletics. Instruction and practical demonstrations in starting, sprinting, middle distance and distance running, relay racing, hurdling, high and broad jumping, pole vault, shot putting, discus, hammer and javelin throwing. Methods of preparing contestants for the various events. Mr. Sweet. 1 rec.; 2 lab.; 2 cr.

48. Basketball. History of basketball with a consideration of its educational values. Theory and practice in the fundamentals of individual offense and defense. The various styles of team offense and defense and rules of the game. Problems in handling and conditioning a team. Mr. Swasey. 1 rec.; 2 lab.; 2 cr.

61. Problems of Teaching in Physical Education. Methods and materials of instruction, theories of play, and actual practice for the successful teaching of recreational activities in school, in the playground, and in the community. Studies of activities adapted to different levels or maturity. Mr. Lundholm. 3 rec.; 3 cr.

63. Care and Prevention of Injuries. Nature and causes of injuries incident to physical activities, the common hazards of play, and preventive measures for children and athletes are discussed. First aid principles are presented. Elective for seniors who have taken one of the following: P.E. 45, 46, 47, 48. Mr. Blood. 2 rec,; 2 cr.

65. Administration of Physical Education in Secondary Schools. The aims and objectives of health and physical education. Organization and supervision of a complete unified program of health and physical education including the legal aspects, intra-mural and inter-scholastic athletics, medical problems, budgeting, financing, maintenance of equipment, publicity programs, and office management. Each student will be given an opportunity to serve on a committee to draw up an original program of health and physical education in a theoretical or actual situation found in some secondary school. Prereq.: Zool. 17-18; P.E. 23 and 61; and two courses in the coaching of sports. These last may be taken concurrently. Mr. Olson. 3 rec.; 3 cr.

93, (93). Education-Physical Education (Ed-PE). Directed Teaching in Physical Education. Given in the Department of Physical Education and Athletics for Men. Prereq.: Zool. 17-18; P.E. 23 and 61. The student must have completed the methods course in the sport which he is directing or take the course concurrently. 3 cr.

PHYSICAL EDUCATION FOR WOMEN

Marion C. Beckwith, *Director and Professor of Physical Education for Women;* Evelyn Browne, *Associate Professor;* Caroline S. Wooster, *Associate Professor;* Barbara K. Newman, *Associate Professor;* Joan T. Stone, *Assistant Professor;* Jacqueline A. Clifford, *Instructor;* Patricia O. Clow, *Instructor;* Patricia A. Ablett, *Instructor;* B. Joyce Mills, *Instructor;* Florence R. Mleczko, *Instructor*

The Department of Physical Education for Women aims to develop in each individual the physical, social, and mental qualities which will enable her to meet successfully the demands of modern society. The course includes recreational and leisure-time activities, vigorous team sports and gymnastics, rhythmic and dance activity, and the opportunity to participate in club activities which are provided primarily for the more highly skilled. This program is supplemented by the extra-curricular competition sponsored jointly by the Women's Recreation Association and the Department.

Requirements. All women students are required to complete at least one credit of physical activity for each of the first six semesters they attend the University. Freshmen women should register for P.E. 1, 2; sophomores for P.E. 3, 4; and juniors for P.E. 5, 6. A second activity may be elected each semester for additional credit (P.E. 11, 12, 13, 14, etc.). Unless there is a beginning and intermediate section the same activity shall not be credited more than twice.

Physical Examination. Each student must, before entering, have had a physical examination by a physician. A posture test will be given by the Physical Education staff. Individual gymnastics is required of each freshman whose physical condition indicates this need. Students with physical disabilities must follow the same procedure as other students including registration for physical education. In most cases, modified activities are recommended by the University Physician.

Motor Ability Test. All students are expected to take the Humiston Motor Ability Test the fall that they enter the University.

Advanced Instruction. To provide for the more highly skilled student and to encourage the interest and ability of the less skilled, the Department includes in its program numerous club and interclass activities in which advanced instruction is given by a member of the teaching staff. Membership: Open to any University student. Qualifications: Club standards or membership of class squad.

Clubs and Instructors: Dance Club — Miss Ablett; Rifle Club — Miss Browne; Durham Reelers — Mrs. Clow; Ski Club — Miss Newman; W.R.A. — Miss Stone; and staff. A Riding Club is also available — Mr. Kimball, Instructor, Animal Science Department.

Women students following any Teacher Training curriculum are urged to elect for required Physical Education the following activities: folk dancing, social recreation, volleyball, hockey, basketball, and American country dancing.

Required Costume, Fees, and Equipment. Special gymnasium uniforms consist of blue cotton tennis-type dress and shorts, white socks, and regulation gymnasium sneakers. Students are required to furnish their own individual equipment for such activities as tennis, skiing, and skating. Equipment is furnished for golf, fencing, badminton, hockey, archery, lacrosse, riflery, and softball. The special riding fee is $25 a quarter for two periods a week.

1, 2, 3, 4, 5, 6. Physical Education. Students should register for one activity (meeting two hours a week) from the lists below. One additional hour of fundamentals (freshmen) or dance survey (sophomores) will be arranged by the Department. 3 hrs.; 1 cr.

(1), (2), (3), (4), (5), (6). Physical Education. The parenthesis indicates a first semester course taken second semester and vice versa; this is for transfer students and for those who have failed, etc. (See description above.) 3 hrs.; 1 cr.

Activity Courses

(elect one each quarter)

First Quarter: Apparatus, archery (elem. + inter.), badminton, dance workshop, golf (elem. + inter.), modern dance, hockey, individual gym, riding* (beg. + elem. + inter. + colt training), stunts and tumbling, tennis (elem. + inter.), touch football.

Second Quarter: Basketball, badminton (elem. + inter.), dance workshop; fencing, folk dancing, gymnastics, modern dance (elem. + inter.), individual gym, riding* (beg. + elem. + inter + colt training), riflery, skating (elem. + figure), skiing (beg.), social recreation, stunts and tumbling.

Third Quarter: American country dance, badminton, (elem. + inter.), dance composition, dance workshop, elementary games, fencing, individual gym, modern dance (elem. + inter.), riding* (beg. + elem. + inter. + colt training), riflery (elem. + inter.), skating (elem. + figure), skiing (beg. + elem. + inter + ad), social recreation, stunts and tumbling, volleyball.

Fourth Quarter: Archery (elem. + inter.), badminton (elem. + inter.), campcraft, casting and angling, dance workshop, golf (elem. + inter.), individual gym, lacrosse, riding* (beg. + elem. + inter. + colt training), softball, tennis, (elem. + inter.).

Required of freshmen, sophomores, and juniors. 3 periods; 1 cr.

7, 8. Physical Education. Elect courses from the list under P.E. 1, 2. Elective for seniors. 2 hrs.; 1 cr.

11, 12, 13, 14, 15, 16, 17, 18. Physical Education. Elective courses open to freshmen, sophomores, juniors, and seniors respectively may be chosen from the lists under 1, 2, 3, 4, 5, 6. 2 hr.; 1 cr.

Theory Courses

23. Principles of Physical Education. See course description under Department of Physical Education for Men.

24. Organized Camping. The methods, objectives, and purposes of organized camping; standards, facilities, equipment, food, sanitation, health, and safety requirements; program planning and leadership qualifications; integration of camping in the public schools. Mrs. Wooster. Elective for sophomores, juniors, and seniors. 3 lec. or rec.; 3 cr.

(36). Recreation Leadership. History, organization, program planning, and administration of community recreation and playgrounds; philosophy of recreation. Mrs. Clow. Elective for sophomores, juniors, and seniors. 3 lec. or rec.; 3 cr.

53, 54. The Theory of Teaching Dance. A survey of methods, materials, and techniques in teaching dance. Includes instruction in performance and teaching of rhythms, social, folk and square dance, first semester; modern dance, second semester. Miss Clifford. Prereq.: concurrent with second quarter: folk and square dance; concurrent with third quarter: modern dance

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* See Required Costume, Fees, and Equipment.

(elem.); concurrent with fourth quarter: modern dance (inter.). Open to Physical Education majors or by permission of instructor. 1 lec.; 2 lab.; 2 cr.

55. Remedial Gymnastics. The adaption of exercise to individual needs, capacities, and limitations; causes and treatment of physical abnormalities. Theory and technique of massage. Mrs. Wooster. Prereq.: Zool. 17-18; Zool. 19 or concurrently. 2 lec. or rec.; 2 lab.; 3 cr.

56. Health Education. A general health course designed to acquaint the student with methods, materials and principles of teaching school health. It includes safety education, health examination and recognition and prevention of disease. Miss Ablett. Open to Physical Education majors. Prereq.: Zool. 17. 3 lec. or rec.; 3 cr.

63, 64. The Theory of Teaching Team Sports for Women. The methods involved in the teaching of team sports and lead-up games with emphasis on coaching methods and techniques of officiating. Includes discussion of equipment, history, tactics, and rules of each sport. Miss Stone. Prereq.: Elementary courses in team sports. 2 lec. or rec.; 1 lab.; 2 cr.

(66). Administration of Physical Education in Secondary Schools. Administrative methods in the conduct of physical education, health education, and recreation. The planning of programs and policies in the light of past and present philosophies and in regard to current programs, facilities, equipment, selection of staff, and public relations. Miss Browne. 3 lec.; 3 cr.

73, 74. The Theory of Teaching Individual Sports for Women. The methods and principles involved in the teaching of tennis, badminton, bowling, skating, skiing, golf, and archery. The history, equipment, courtesies, rules, techniques, and strategy of each sport will be discussed. Miss Beckwith and Miss Mills. Prereq.: Elementary work in the courses listed above. Open to junior and senior majors or others by permission of instructor. 1-2 lec. or rec.; 1-2 lab.; 1-2 cr.

P.E.-Ed. 91. Problems in the Teaching of Physical Education for Women. The methods, material, and organization of a comprehensive program of activities for use primarily in the elementary school and in recreation programs. Miss Newman. Prereq.: Elementary games or its equivalent. 3 lec. or rec.; 3 cr.

Ed-P.E. (92), 92. Directed Teaching of Physical Education for Women. Opportunity for teaching physical education activities under direction, primarily in the elementary and secondary schools. Miss Newman. Prereq.: P.E.-Ed. 91 or concurrently. 1 lec. or rec.; 2 5-hr. lab.; 6 cr.

Ed.-P.E. (96), 96. Recreation Field Work. Opportunity for participation in the planning and operation of a variety of recreation programs, under direction, in nearby clubs and community centers. Prereq.: P.E.-Ed. 91 or concurrently: Mrs. Clow. 1 lec. or rec.; 2 5-hr. lab.; 6 cr.

PHYSICAL SCIENCE

(See Geology and Geography)

PHYSICS

Harry H. Hall, *Professor;* Horace L. Howes, *Professor Emeritus;* William H. Hartwell, *Associate Professor;* David G. Clark, *Associate Professor;* John A. Lockwood, *Associate Professor;* John E. Mulhern, Jr., *Assistant Professor;* Robert E. Houston, Jr., *Assistant Professor;* Lyman Mower, *Assistant Professor;* Ralph E. Stajdohar, *Instructor;* John W. Nagle, *Instructor;* William M. Sherry, *Instructor*

1-2. Introductory Physics. Mechanics, properties of matter, heat, magnetism, electricity, wave motion, sound, and light. Demonstration lectures, laboratory, and recitation. A knowledge of high school algebra and plane geometry is essential. This course is not intended for students in the College of Liberal Arts who expect to complete major requirements in Physics. 2 lec.; 1 rec.; 1 lab.; 4 cr.

9, (9). Elementary Physics. An elementary course with emphasis on selected topics from the various fields of physics. A knowledge of high school algebra and plane geometry is a prerequisite. Open only to students in the College of Agriculture. 1 lec.; 2 rec.; 1 lab.; 4 cr.

18. General Physics I. Mechanics. Prereq.: Math. 21, Math. 22 passed or taken concurrently. Must be taken as the introductory course for Physics majors in the College of Liberal Arts. *Cannot be counted for major credit.* 2 lec.; 2 rec.; 4 cr.

21-22. General Physics. Mechanics, heat, light, wave motion, sound, electricity and magnetism. Prereq.: Math. 17 either passed or taken concurrently. Must be taken as the introductory course for Physics majors in the College of Liberal Arts. *Cannot be counted for major credit.* 2 lec.; 3 rec.; 1 lab.; 6 cr. (Offered in 1958-1959 only.)

23-24. General Physics II-III. Electricity and magnetism, heat, wave motion and sound, light. Prereq.: Phys. 18, Math. 23 passed or taken concurrently. Must be taken as the introductory course for Physics majors in the College of Liberal Arts. *Cannot be counted for major credit.* 1 lec.; 2 rec.; 1 lab.; 4 cr. (Not offered until 1959-1960. Phys. 18 and 23-24 will replace Phys. 21-22.)

31-32. Physical Mechanics. An analytical treatment of classical mechanics covering the methods of statics and dynamics of particles and rigid bodies, both in a plane and in space, and the application of these methods to physical problems; oscillations; constrained motion; generalized co-ordinates and Lagrange's Equations. Prereq.: Phys. 21-22 or 23-24, Math. 19-20 or 51-52 passed or taken concurrently. 3 rec.; 4 cr. (Replaces Phys. 85-86.)

33-34. Electricity and Magnetism. Electrostatics, magnetostatics, dielectric theory, electromagnetics, magnetic circuits, alternating currents, complex impedance, thermoelectricity, electromagnetic field. Prereq.: Phys. 21-22 or 23-24, Math. 19-20 or 51-52 passed or taken concurrently. 3 rec.; 4 cr. (Replaces Phys. 83-84.)

35-36. Experimental Physics I and II. Experiments in optics, heat, electricity and magnetism, and atomic physics. Prereq.: Phys. 31-32 and 33-34, taken concurrently. 2 lab.; 2 cr.

37. Modern Physics. An introduction to 20th century physics, including the structure of atoms and nuclei, basic ideas of quantum mechanics and solid state theory. Prereq.: Phys. 23, 24, Math. 23, 24. 3 rec.; 3 cr. (Not offered until 1960-1961.)

38. Physical Electronics. An introductory course in basic electronic phenomena, covering such topics as elementary circuit theory, electron emission, vacuum tube characteristitcs, vacuum tubes as circuit elements, and gaseous discharge. 3 rec.; 3 cr.

43-44. Intermediate Laboratory. This course is intended to augment the student's contact with physical equipment and improve his laboratory technique in precise measurements. Experiments performed have bearing largely on medical problems. Electricity and optics are stressed to a large degree. Prereq.: Phys. 1-2. Open only to pre-medical students. 1 lab.; 1 cr.

81. Physical Optics. A course which starts with Maxwell's Equations and covers the nature of light; interference; diffraction; polarization, and related phenomena. Prereq.: Phys. 33-34, Math. 19 or 24. 3 rec.; 3 cr. (Not offered in 1958-1959.)

82. Thermodynamics. Temperature, work, first and second laws, ideal gases, reversibility and irreversibility, Carnot cycle, entropy, properties of pure substances, thermodynamic applications to pure substances, introduction to the principles of statistical mechanics. Prereq.: Phys. 21-22 or 23-24, Math 19, 20, or 51-52 passed or taken concurrently. 3 rec.; 3 cr. (Not offered in 1958-1959.)

91. Atomic Physics. Elementary particles, restricted relativity, origin of the quantum theory, atomic structure, introductory wave mechanics, atomic, and molecular spectra. Prereq.: Phys. 83-84. 3 rec.; 3 cr.

92. Nuclear Physics. Natural radioactivity, nuclear reactions, nuclear scattering, models of the nucleus, high energy nuclear physics, cosmic rays. Prereq.: Phys. 91. 3 rec.; 3 cr.

93. Introduction to Theoretical Physics I (Mechanics). The subject matter will depend upon the background of the class and will include such topics as mechanics of particles, planetary motion, rigid bodies, an introduction to advanced dynamics. theory of vibrations (particles, strings, and membranes), elasticity, hydrodynamics, sound, and kinetic theory. Prereq.: Math. 19-20 and Phys. 85-86 or its equivalent. 3 rec.; 3 cr.

94. Introduction to Theoretical Physics II. (Electromagnetic Theory). A review of electro-statics and magnetostatics followed by an introduction to the application of Maxwell's Equations to such topics as the propagation of plane waves, the study of wave-guides and resonant cavities, and the theory of scattering, radiation from dipoles, atoms and molecules, the electron theory of dielectrics, and the electromagnetic theory of light. Prereq.: Math. 19, 20, and Phys. 83-84 or equivalent. 3 rec.; 3 cr.

95-96. Experimental Physics III-IV. Work of research type. Special problems are assigned to the individual student. Prereq.: Senior standing in Physics. 2 lab.; 2 cr.

97-98. Physical Colloquium. Participation in departmental colloquium, reading and study. Prereq.: Senior standing in Physics. 1 cr. (Not offered in 1958-1959.)

99. Special Topics. A course designed to cover any selected topics not sufficiently well covered in a general course. Prereq.: Math. 19-20 passed or taken concurrently. Senior standing in Physics. 1, 2, or 3 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

POULTRY SCIENCE

WINTHROP C. SKOGLUND, *Professor;* RICHARD C. RINGROSE, *Professor;* ALLEN C. CORBETT, *Associate Professor;* WILLIAM R. DUNLOP, *Associate Professor;* WALTER M. COLLINS, *Associate Professor;* JAMES GILL, *Assistant Professor;* RICHARD STROUT, *Instructor*

2. POULTRY PRODUCTION. The general principles of poultry husbandry and their practical application with emphasis on factors of culling, breeding, housing, feeding, marketing, diseases and parasites, incubation, and management. Mr. Skoglund. 2 lec.; 1 lab.; 3 cr.

3. AVIAN BIOLOGY. A study of the anatomy, physiology, and endocrinology of the fowl. Mr. Collins and Mr. Gill. 2 lec.; 2 cr. (Alternate years; offered 1958-1959.)

4. POULTRY SELECTION AND REPRODUCTION. The theory and principles involved in selection of poultry, embryonic development, and incubation and brooding practices. Mr. Skoglund. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1958-1959.)

6. POULTRY NUTRITION. The principles of feeding; analysis of recent experimental work and current feed problems. Mr. Ringrose. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1958-1959.)

7. POULTRY HOUSING. Design and construction of poultry houses and equipment; costs of materials; management principles. Mr. Skoglund. 1 lec.; 1 lab.; 2 cr. (Alternate years; offered 1958-1959.)

17. POULTRY JUDGING. Advanced training in poultry selection. A judging team participates in an intercollegiate contest. Mr. Collins. 1 lab.; 1 cr.

19. POULTRY MARKETING. The preparation of poultry and eggs for market. Egg qualities and grades, candling and packaging; egg and poultry market conditions; practical instruction in killing, picking, and dressing. Mr. Ringrose. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1958-1959.)

21-22. POULTRY DISEASES. The first semester will emphasize the fundamentals of disease control. Physiology and anatomy will be briefly covered as background for the study of bacterial, fungus, and parasitic diseases of chickens. The second semester will cover basic principles of virology with application to the prevention and control of avian virus diseases. 2 lec.; 1 lab.; 3 cr. (Alternate years; not offered 1958-1959.)

26. POULTRY MANAGEMENT. The application of successful business principles to poultry farming; study of surveys and production costs. As a part of the laboratory work, visits are made to numerous poultry farms in order to study various types of enterprises. Mr. Skoglund. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1958-1959.)

27, 28. POULTRY SEMINAR. Students abstract experimental data and report on various current topics. Department staff. 1-hour conference; 1 cr.

29. POULTRY BREEDING. The genetic principles involved in breeding for egg and meat production, including practical application and demonstration. Mr. Collins. 2 lec.; 1 lab.; 3 cr. (Alternate years; offered 1958-1959.)

53, 54. POULTRY PROBLEMS. Students are given a selection of various problems and are required to compile and present accurate and detailed information in their solution. Department staff. 1 to 3 cr.

56. Turkey Production. Subject matter covered includes varieties and their commercial importance; breeding methods, including the National Turkey Improvement Plan; brooding and rearing methods; feeding, housing, and management practices. Mr. Ringrose. 2 lec.; 2 cr. (Alternate years; not offered 1958-1959.)

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

PSYCHOLOGY

Herbert A. Carroll, *Professor;* George M. Haslerud, *Professor;* Lenin A. Baler, *Associate Professor;* Brian R. Kay, *Assistant Professor;* Samuel Karson, *Assistant Professor;* Fred M. Jervis, *Lecturer*

1, (1). General Psychology. The systematic study of human behavior, especially with reference to the fundamental principles governing the development of the individual, motivation, emotion, learning, perception, thinking, and individual differences. Mr. Haslerud, Mr. Karson, and Mr. Kay. Not open to juniors and seniors. 3 lec.; 3 cr. *This course cannot be counted for major credit.*

32. Industrial Psychology. A survey of the applications of psychology to business and industry. Topics covered include: communication and human relations, accident prevention, conditions of work, human engineering, motivation of workers, and an introduction to recruitment, selection, and training of personnel. Mr. Kay. Prereq.: Psych. 1. Not open to freshmen. 3 lec.; 3 cr.

37. Developmental Psychology. The psychological development of the individual, with special emphasis upon early childhood and adolescence. Some consideration of the older age groups. Practical application is stressed. Case histories and field projects are used as study methods. Mr. Baler. Not open to freshmen. 3 lec.; 3 cr. (*This course replaces Psych. 51 and 52.*)

44. Psychology of Personality. An exploration into the meaning of the normal personality as seen in current psychological perspective. Expressive traits, perceptual orientations, and motives are viewed as interactiong components of the personality structure. Case histories, personality tests, and experiments are employed as study methods. Mr. Baler. Prereq.: Psych. 1 or 37 or 47. Not open to freshmen. 3 lec.; 3 cr. (*Formerly Psych. 74.*)

47, (47). Mental Hygiene. An examination of the fundamental emotional satisfactions desired by human beings and a consideration of the several ways in which these desires are thwarted. The mental conflicts growing out of such thwartings and ways of resolving them will be the central theme of the course. Specific applications of the principles of mental health will be made to the problems of college students. Mr. Carroll, Mr. Baler, and Mr. Karson. Not open to *first semester* freshmen. 3 lec.; 3 cr. (*This course cannot be counted for major credit.*)

54. Psychopathology. A systematic examination is made of the more severe behavioral disorders as found in the major forms of the neuroses and psychoses. The ego defense mechanisms and the construct of anxiety are seen as central to the understanding of these disorders. The search for causes,

the interpretation of symptoms, and the methods of treatment are considered in detail. Mr. Karson. Prereq.: Psych. 47. 3 lec.; 3 cr. (*Formerly Psych. 48.*)

57. EXPERIMENTAL PSYCHOLOGY. A study of experimental methods in psychology, including discussion of theory and practices in applying these methods to a variety of psychological phenomena. Each student in the class will be responsible for an individual experimental project. Mr. Haslerud. Prereq.: Psych. 1. 1 lec.; 1 lab.; 3 cr.

58. PSYCHOLOGY OF LEARNING. A study of the experimental support for and the practical implications of contemporary theories of learning. Mr. Haslerud. Prereq.: Psych. 1. 3 lec.; 3 cr.

63. DIFFERENTIAL PSYCHOLOGY. A study of individual differences with special attention being given to those who are intellectually gifted or mentally retarded. Mr. Carroll. Prerep.: Psych. 1. 3 lec.; 3 cr.

67. STATISTICS IN PSYCHOLOGY. A study of the problems and methods involved in the statistical treatment of quantitative data in psychology. Both the computation and interpretation of elementary statistical measures, such as mean, median, standard deviation, t-test or critical ratio, and the various methods of correlation are considered in detail. Mr. Karson. Prereq.: Psych. 1. 3 lec.; 3 cr.

78. PHYSIOLOGICAL PSYCHOLOGY. A study of the relation between behavior and the structure of the organism. Special attention to the sensory, nervous, and glandular functions as the organic base for motivation, emotion, learning, etc. Mr. Haslerud. Prereq.: Psych. 1. 3 lec.; 3 cr.

83. SYSTEMATIC PSYCHOLOGY. The complex expansion of contemporary psychology as seen in historical perspective. A consideration of some of the major antecedents in philosophy, theology, and the physical sciences. Emphasis is placed on the subsequent extensive development of psychology in the United States in the form of complementary schools and systems of thought and research. Mr. Baler. Prereq.: Psych. 1. 3 lec.; 3 cr.

86. PERSONNEL PSYCHOLOGY. An intensive study of the principles involved in the selection and placement of personnel. The course is offered primarily for students intending to specialize in the personnel field. Topics covered include: counseling, interview techniques, psychological tests, and the personnel officer in industry. Some knowledge of elementary statistics is desirable. Mr. Kay. Prereq.: Psych. 1. 3 lec.; 3 cr.

89. MENTAL HYGIENE IN TEACHING. A study of the fundamental needs of human beings, with special emphasis on the mental and emotional conflicts of secondary-school students arising from the thwarting of these needs. Ways of recognizing these conflicts by their manifestations. and of helping students to resolve them, will be treated extensively in the course. Attention will also be given to the mental hazards of the teaching profession. Mr. Jervis. 3 cr. *Not open to students who have completed Psych. 47.*

95. ADVANCED GENERAL PSYCHOLOGY. A systematic study of current psychology to help the student, by lectures, demonstrations, and reports, to obtain a broad, integrated view of the subject as both science and art. Mr. Haslerud. Prereq.: 12 semester credits in Psychology. 3 rec.; 3 cr. *Required of all undergraduate majors in Psychology.*

98. Seminar in Psychology. An extensive term paper on subjects chosen by the individual student. This project in library research meets the Department's requirement for a comprehensive paper. Mr. Carroll and Mr. Kay. Prereq.: 15 semester credits in Psychology. 3 cr. *Required of all undergraduate majors in Psychology.*

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

PUBLIC SPEAKING

(*See English*)

RADIO

(*See English*)

RECREATION EDUCATION

(*See Physical Education Teacher Preparation Curriculum for Women*)

RESERVE OFFICERS TRAINING CORPS

Department of Military Science and Tactics

Lieutenant Colonel Hugh G. Brown, Artillery, *Professor;* Major Peter K. Dilts, Infantry, *Assistant Professor;* Major Jack W. Spiller, Infantry, *Assistant Professor;* Captain Ben O. White, Jr., Infantry, *Instructor;* Captain Clark Smith, Artillery, *Instructor;* Master Sergeant Joseph A. White, *Assistant;* Master Sergeant Joseph A. Rathbun, *Assistant;* Sergeant First Class Mancil L. Thompson, *Assistant;* Sergeant First Class Charles R. Willey, Jr., *Assistant;* Master Sergeant Clarence P. Andersen (US Army Retired), *Custodian of Supply*

The Army ROTC basic course provides fundamentals of military training and history. It satisfies the two-year compulsory ROTC requirement of the undergraduate. The advanced course prepares selected juniors and seniors for service as commissioned officers in the United States Army Reserve. In order to qualify for the advanced course, a student must have a 1.8 cumulative average at the end of his sophomore year. Successful completion of the prescribed general Military Science courses, and the award of a baccalauerate degree by the University, prepares a member of the Army ROTC for a commission in one of fifteen branches or services of the Army. Distinguished Military Students may earn appointments as Second Lieutenants in the Regular Army.

Military Science courses are co-aligned with a student's normal academic progression; i.e., a student must take M.S. 11-12 during his freshman year, and M.S. 21-22 during his sophomore year. If he elects and is accepted for the advanced ROTC course, he must take M.S. 31-32 and M.S. 41-42 during his junior and senior years, respectively.

M.S. 11-12. First Year Basic. The principles of the art of warfare as exemplified in American military history. The organization of the Army and the ROTC. Practical training in leadership, military drill, and command. Familiarization with basic weapons and rifle marksmanship. Minimum of three hours of formal instruction per week. 1½ cr.

M.S. 21-22. Second Year Basic. The science of military maps and map-reading. The role played by the Army in national affairs. Practical familiarization with crew-served weapons and basic gunnery. Practical application of leadership, drill, and command. Minimum of three hours of formal instruction per week. 1½ cr.

M.S. 31-32. First Year Advanced. The principles of leadership. The theory and practice of teaching methods. The organization, functions, and missions of the various branches of the Army. Small unit tactics. Military communications facilities. Exercise of command of small units. Minimum of five hours of formal instruction per week. 3 cr.

M.S. 41-42. Second Year Advanced. An introduction to the military staff and staff work to include movements, supply and evacuation, motor transportation, military administration, and justice. Theory of troopleading to include estimate of the situation, and combat orders. Practical application of leadership principles and exercise of command. Role of the United States in world affairs and the present world situation. Officer indoctrination and customs of the service. Minimum of five hours of formal instruction per week. 3 cr.

Department of Air Science

Colonel James H. Starbuck, USAF, *Professor;* Major Freeman W. Bowley, Jr., USAF, *Assistant Professor;* Captain Albert J. Britton, USAF, *Instructor;* Captain Donald V. McDougall, USAF, *Instructor;* Captain William R. Powers, Jr., USAF, *Instructor;* Captain Alfred J. Sciarappa, USAF, *Instructor;* Captain James L. Thompson, USAF, *Instructor;* Master Sergeant Edward F. Cloutier, USAF, *Instructor;* Master Sergeant William H. Davis, USAF. *Assistant;* Master Sergeant Everett I. Hodsdon, USAF, *Assistant;* Technical Sergeant James H. Nash, USAF, *Assistant;* Technical Sergeant Halvor A. Magnus, USAF, *Assistant;* Staff Sergeant Donald M. Bartz, USAF, *Assistant;* Staff Sergeant Richard P. Phillipo, USAF, *Assistant*

Entrance requirements for basic Air Force ROTC are lenient, while those for advanced are quite strict. Selection for advanced in both the flying and non-flying categories is based on character, attitude, academic record, and leadership ability. The student must have a minimum grade-point average of 1.8 and an Air Science average of C or better at time of selection, and must successfully complete a battery of officer qualification tests.

About one-half of those admitted into advanced must be physically qualified for, and desire, flight training. As seniors they will receive 36½ hours of flight instruction under the supervision of the CAA to meet requirements of a private license. Due to the need for Air Force officers with engineering and meteorological backgrounds, students taking such courses are urged to apply for the advanced phase.

A.S. 15-16. First Year Basic. This course presents an introduction to Air Force ROTC, elements and potentials of air power, air vehicles and principles of flight, military instruments of national security, professional opportunities in the United States Air Force, military courtesy, element and mass drill, and other leadership exercises. Minimum of three hours of formal instruction. 1½ cr.

A.S. 25-26. Second Year Basic. More technical than the first-year basic course, this course considers the elements of aerial warfare, covering such topics as historical background, targets, weapons, aircraft, the air ocean and strategic concept, bases, and forces; careers in the USAF; leadership laboratory; cadet non-commissioned officers training. Minimum of three hours of formal instruction. 1½ cr.

A.S. 35-36. First Year Advanced. A course designed to provide some of the fundamentals essential to optimum effectiveness of Air Force officers. The first semester is devoted to the responsibilities and functions of commanders and the principles of effective staff work; logic and problem-solving techniques, including group dynamics and conference procedure; semantics, expression, and the elements of the communications process; and basic principles of military law and the organization, operation, and reporting of courts and boards. The second semester is more technical and deals with Applied Air Science, to include aerodynamics, aircraft, engineering, navigation, and weather; Air Force base functions, Leadership laboratory as provided by command and staff positions with the cadet wing prepare the student for the summer training program which normally follows immediately after A.S. 36. During summer training the student will have the opportunity to become familiar with life on an Air Force base and obtain orientation flights in the latest type aircraft in the Air Force. Minimum of five hours of formal instruction. 3 cr.

A.S. 45-46. Second Year Advanced. This course is designed to prepare cadets for duties upon their entrance into the Air Force as junior or squadron-level officers. Principles of leadership and management (seminar). career guidance, military aspects of world political geography, military aviation and the art of war, briefing for commissioned service. Second year advanced students gain wide experience in leadership through planning and supervising drill, instructing subordinates, and performing command and staff functions. Minimum of five hours of formal instruction. 3 cr.

SOCIAL SCIENCE

The course listed is given under the auspices of the Division of Social Science of the Faculty of the College of Liberal Arts. This Division includes the departments of Economics and Business Administration, Government, History, Hotel Administration, Psychology, and Sociology.

81, (81). Internships. Actual field work in a department of the state or local government or in a selected and approved private agency. The work will be in charge of the department or agency to which the student is appointed. Arrangements for each student will be in charge of the Chairman of the Department involved or his representative. Prereq.: Internships for seniors only may be approved by the departments of Economics and Business Administration, Government, History, Psychology, or Sociology. Not more than 16 credits. *No more than 9 credits may be counted toward the completion of major requirements.*

SOCIAL SERVICE

(See Social Service Curriculum)

SOCIOLOGY

RICHARD DEWEY, *Professor;* CHARLES W. COULTER, *Professor Emeritus;* MELVILLE NIELSON, *Associate Professor;* OWEN B. DURGIN, *Assistant Professor;* J. GORDON SHAW, JR., *Assistant Professor;* STUART H. PALMER, *Assistant Professor*

Except when a student's major or prescribed curriculum requires it, juniors and seniors will not be admitted to Sociology 1-2. Experience has shown that upperclassmen wishing to elect one or more courses in sociology do well to take certain of the courses numbered from 33 to 72, inclusive, which are of a more specialized interest yet do not place a non-major at a disadvantage.

1-2. INTRODUCTORY SOCIOLOGY: PRINCIPLES AND PROBLEMS. An orientation to the study of groups, institutions, and culture by observational methods, followed by application of these principles to selected social problems. Numerous field studies are described which have provided the basis for current knowledge of group behavior, social organization, and social control. Mr. Dewey, Mr. Nielson, Mr. Shaw, and Mr. Palmer. For freshmen and sophomores only. 3 lec. or rec.; 3 cr.

33. CULTURAL ANTHROPOLOGY. A study of the concepts and methods of anthropology. The following are considered in detail: the structure of culture; culture and personality; economic, family, educational, political, and religious institutions; art; language. Data concerning various primitive societies are presented. Mr. Palmer. Prereq.: Permission of the instructor. Not open to freshmen. 3 lec. or rec.; 3 cr.

34. MINORITY GROUP RELATIONS. A study of minority-majority group relations, with most of the descriptive material relating to the Negro and other minorities in the United States. Attention is focused on the nature of minorities, development of prejudice, effects of prejudice on minority and majority groups, areas of discrimination, and programs for change. Mr. Nielson. Not open to freshmen. 3 lec. or rec.; 3 cr.

39. RURAL SOCIOLOGY. The rural community, its extent, location, and typical ecological pattern as adaptation to local conditions. The rural population, origin, characteristics, mobility, and relation to the land. Function of formal and informal organizations as cohesive forces within the community. Mr. Durgin. Not open to freshmen. 3 lec. or rec.; 3 cr.

43. URBAN SOCIOLOGY. Developmental factors producing cities, with emphasis on rise of the modern city. Forces bringing about commercial, industrial, and residential areas within the city. The urban population, origin, characteristics, and mobility. Social institutions studied as adaptation to urban life. Function of various media of communication as cohesive forces within the city. Mr. Dewey. Not open to freshmen. 3 lec. or rec.; 3 cr.

44. SOCIAL PSYCHOLOGY. The effects of group situations on recall, perception, attitudes, and various overt behaviors. Factors in morale; hypotheses of conforming behavior; reactions to social frustration; factors in prejudices; effects of mass communication; stereotypes; propaganda; measurement of

public opinion; critical social situations. Mr. Dewey. Prereq.: Soc. 1 or Psych. 1. Not open to freshmen. 3 lec. or rec.; 3 cr.

52. Population Analysis. A seminar course in demography. Current and past theories of population change are discussed. The population structure and potential growth of various countries are examined and the import of such information for U. S. policies is discussed. Drawing on the materials from the U. S. Census of Population and U. S. Vital Statistics, the population of this country is examined in terms of: (1) its distribution by age, sex, race, marital status, and level of education; (2) the differential rates of birth and death for different sub-populations; and (3) the patterns of migration within and between states. Methods for determining the various rates and indices of change, and the limits on their use are presented. Mr. Shaw. 3 lec. or rec.; 3 cr.

54. Culture Change. Theories of culture change are evaluated. The processes of discovery, invention, diffusion, and acculturation are illustrated by selected anthropological studies of the cultures of non-literate and literate societies. Mr. Palmer. Prereq.: Soc. 33 and permission of the instructor. 3 lec. or rec.; 3 cr.

57. Social Stratification. A study of social stratification, with most of the descriptive material relating to the social class system of the United States. Attention is focused on theories of stratification, stratification systems, class interests, class conflicts, class differentials, and social mobility. Mr. Nielson. Prereq.: Permission of the instructor. 3 lec. or rec.; 3 cr. (Alternate years; offered 1958-1959.)

59. Aging in the American Society. Social differentiation on the basis of age groups, with the aged in the contemporary American society being emphasized. Attention is focused on attitudes and behavior toward the aged, attitudes and behavior of the aged, and problems of the aged in society. Proposed programs for change in the treatment and behavior of the aged are examined. Mr. Nielson. 3 lec. or rec.; 3 cr. (Alternate years; not offered 1958-1959.)

71, (71). Criminology. A survey of the scientific study and the control of crime. The following are considered in detail: indexes and rates of crime; theories of crime; juvenile delinquency; police, courts, prisons, probation, and parole. Case studies are presented. Mr. Palmer. 3 lec. or rec.; 3 cr.

72, (72). The Family. A study of the family as a social institution, with most of the descriptive material relating to the contemporary American family. Attention is focused on the variety of family forms, sex behavior patterns, mate selection, marital adjustment, parent-child relations, family crises, and family reorganization. Mr. Nielson. 3 lec. or rec.; 3 cr.

73, 74. Introduction to Social Welfare. Survey of the field of social welfare: history, public welfare, case work, social group work, community organization for social welfare. Mr. Nielson. For Sociology majors and students enrolled in the Social Service curriculum; others may be admitted by permission of the instructor. 3 lec. or rec.; 3 cr.

75, 76. Methods of Social Research. Analysis of research problems. Designing field studies and experiments. Demonstration and practice in sampling, schedule construction, and interviewing techniques. The first semester will emphasize use of elementary statistical techniques in analysis of prepared data. The second semester will emphasize methods of observation. Mr. Durgin. For Sociology majors and students enrolled in the Social Service curriculum; others may be admitted by permission of instructor. 3 lec. or rec.; 3 cr.

89. DEVELOPMENT OF SOCIOLOGICAL THOUGHT. A consideration of the development of social thought from Plato to the present through the examination of the writings of selected individuals. Emphasis in the early part of the term is on the 19th century European social philosophers. The remainder of the term centers attention on the ideas of U. S. social scientists, especially on their contributions to present day sociological thought. Mr. Shaw. Students not majoring in Sociology may be admitted by permission of the instructor. 3 lec. or rec.; 3 cr.

92. FIELDS OF SOCIOLOGY. A consideration of various subject areas of sociology indicating their growth and development, their relationship to one another, and their current status with regard to research and theory. A discussion of recent developments and the newer subject areas of sociology. Future developments, as extensions of present trends, are discussed. Mr. Shaw. Students not majoring in Sociology may be admitted by permission of the instructor. 3 lec. or rec.; 3 cr.

93. MASS COMMUNICATION. Emphasis is on description of how press, radio, and screen perform essential functions in our society. Content of their messages, characteristics of their audiences, and probable impact are analyzed, using current periodicals, films, and broadcasts as material. The importance of word-of-mouth communication as pattern and sounding board of mass communication is examined. Mr. Shaw. Prereq.: Permission of the instructor. 3 lec. or rec.; 3 cr.

97. SOCIAL WELFARE FIELD EXPERIENCE. To give the student an understanding of social welfare through observation and participation. Students will work in a social welfare setting for a period of eight weeks (or its equivalent). This field work is generally done during the summer following the junior year. Weekly seminar sessions constitute the classroom work of the course. Mr. Nielson. Prereq.: Soc. 73, 74 and permission of the instructor. 6 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

ZOOLOGY

George M. Moore, *Professor;* C. Floyd Jackson, *Professor Emeritus;* Lorus J. Milne, *Professor;* Edythe T. Richardson, *Professor;* Emery F. Swan, *Associate Professor;* Wilbur L. Bullock, *Associate Professor;* Paul E. Schaefer, *Associate Professor;* Philip J. Sawyer, *Assistant Professor;* Marian H. Pettibone, *Assistant Professor;* Dorothy F. Travis, *Assistant Professor;* Marcel E. Lavoie, *Assistant Professor;* Merritt A. Gibson, *Instructor*

7. General Zoology. Basic course for Zoology majors and Pre-Medical students. Systematic survey of the animal kingdom including consideration of the natural history and functional relationships, accompanied by dissection in the laboratory of selected types. Miss Pettibone. Prereq.: Biol. 2, or Zool. 48. 3 lec. or rec.; 2 lab.; 5 cr.

8. Comparative Anatomy. Fundamental principles of comparative vertebrate anatomy. Selected vertebrate types dissected in the laboratory. Miss Pettibone. Prereq.: Zool. 7. 3 lec. or rec.; 2 lab.; 5 cr.

17. Human Anatomy. A study of the structure of the human body including gross and microscopical anatomy of the various systems. Collateral reading, written reports, and conferences. Mrs. Richardson and Mr. Lavoie. Prereq.: Biol. 2. 3 lec.; 1 lab.; 4 cr. *(Not open to those who have credit for Zool. 8.)*

18. Human Physiology. A study of the principles involved in the functioning and integration of the various systems of the body. Collateral reading, written reports, conferences. Mrs. Richardson. Prereq.: Zool. 17 or Zool. 8. 3 lec.; 3 cr. *(Not open to those who have credit for Zool. 20.)*

19. Kinesiology. A study of bodily movements. Special emphasis is given to the relation of skeleton, muscles, and joints in movements. Designed primarily for Occupational Therapy students and for students in the Physical Education Teacher Preparation curriculum. Mrs. Richardson. Prereq.: Zool. 17 and 18 or 20. 2 lec. or rec.; 1 lab.; 3 cr.

20. Human Physiology. A study of the principles involved in the functioning and integration of the various systems of the body; laboratory work; collateral reading; written reports; conferences. Mrs. Richardson and Mr. Lavoie. Prereq.: Zool. 17 or Zool. 8. 3 lec.; 1 lab.; 4 cr. *(Not open to those who have credit for Zool. 18.)*

36. Ornithology. A study of birds, their identification, migration, life history, anl economic importance with special reference to those of eastern North America. Designed for students interested in wildlife conservation, for secondary-school teachers, and for others interested in bird study as a hobby. Mr. Sawyer. Prereq.: Biol. 2 or equivalent. 1 lec.; 2 lab. or field trips; 3 cr.

48. Principles of Zoology. The principles of animal biology, including embryology, physiology, and genetics, with emphasis on man and other vertebrates. A study of the relationship between living things and their environment. Mr. Gibson. *Required of freshmen in Agriculture.* 2 lec.; 1 lab.; 3 cr. *This course cannot be used to satisfy major requirements.* (Not open to those who have credit for Biol. 1-2.)

Advanced Courses in Zoology

All the following courses require junior or senior standing.

51. Parasitology. An introductory course concerned with some of the more important parasites causing diseases of man and animals. Living materials will be used as far as possible. Mr. Bullock. Prereq.: Biol. 2 and a year of Zoology. 2 lec.; 2 lab.; 4 cr.

55. Marine Invertebrate Zoology. A survey of the major invertebrate groups with emphasis on the inshore marine fauna. About one fourth of the laboratory time will be devoted to field work with emphasis on natural history and ecological relationships. Mr. Moore and staff. Prereq.: General Zoology. 3 rec.; 3 lab.; 6 cr.

56. Freshwater and Terrestrial Invertebrates. The natural history and taxonomy of the invertebrates of land and freshwater, exclusive of insects, with special reference to those of eastern North America. Mr. Moore. Prereq.: General Zoology. 2 rec.; 2 lab.; 4 cr. (Alternate years; offered 1958-1959.)

57. Comparative Physiology. A course designed to study in a comparative manner the functional systems found throughout the animal kingdom. Major emphasis will be placed on the functional or ecological adaptations of the organism to its environment. Miss Travis. Prereq.: Zool. 7; 20 or 59; a year of college Physics, and a course in Organic Chemistry. 3 lec. or rec.; 2 lab.; 5 cr. (Alternate years; not offered 1958-1959.)

59. General Physiology. A course designed to study the fundamental physiological properties of the living system. Initial considerations will be concerned with the plasma membrane and associated membrane phenomena, followed by a consideration of the chemical and physical nature of the living system. The fundamental physiological properties of excitability, contractility, conductivity, metabolism, growth, and reproduction will then be considered. Miss Travis. Prereq.: Biol. 2, one year of Zoology, a year of college Physics, and a course in Organic Chemistry. 3 lec. or rec.; 1 lab.; 4 cr. (Alternate years; offered 1958-1959.)

61. Genetics. A study of the physical basis of inheritance, expression, and interaction of the hereditary units, linkage, and variation. The application of Mendelian principles to plant and animal breeding. Mrs. Richardson. Prereq.: Biol. 2 or Bot 1 and Zool. 48. 3 lec. or rec.; 3 cr.

64. Neurology. Practical study of morphology, physiology, and histology of the human nervous system. Mrs. Richardson. Prereq.: Biol. 2 and one year of Zoology. 3 lec. or rec.; 1 lab.; 4 cr.

65. Embryology. A study of the fundamental principles of development. The developmental process from the egg to the formation of the body and the establishment of the principal organs and systems. Mr. Gibson. Prereq.: Zool. 8. 2 lec.; 2 lab.; 4 cr.

66. Elements of Histology and Microtechnique. A study of the microscopic anatomy of principal tissues and organs of vertebrates with an introduction to general histological technique. Mr. Bullock. Prereq.: Zool. 8 or 17. 2 lec.; 2 lab.; 4 cr.

77. Natural History and Taxonomy of the Vertebrates. A study of vertebrate animals exclusive of birds; their habits, habitats, life histories, with special reference to those occurring in eastern North America. Techniques of collection, identification, and preservation are included. Mr. Sawyer. Prereq.: General Zoology. 3 rec.; 2 lab.; 5 cr.

87, 88. Zoology Seminar. Seminar discussions on current zoological literature conducted each week. Primarily for seniors majoring in Zoology and for graduate students. May be elected by permission of the Chairman of the Department. Mr. Moore and staff. 1½ hours per week; 1 cr.

97, 98. Special Problems. Advanced students may elect a special problem provided they present a detailed outline of the subject and can furnish adequate proof of their ability to carry it out with equipment available. Mr. Moore and staff. Prereq.: Permission of the Chairman of the Department. 1-4 cr.

FOR COURSES PRIMARILY FOR GRADUATE STUDENTS SEE CATALOGUE OF THE GRADUATE SCHOOL

Summary of Registration

	AGRICULTURE				LIBERAL ARTS				TECHNOLOGY				MISCELLANEOUS				TOTAL											
																	MEN				WOMEN				BOTH			
	1956-57	1955-56	1954-55	1953-54	1956-57	1955-56	1954-55	1953-54	1956-57	1955-56	1954-55	1953-54	1956-57	1955-56	1954-55	1953-54	1955-56	1956-57	1954-55	1953-54	1956-57	1955-56	1954-55	1953-54	1956-57	1955-56	1954-55	1953-54
Senior	56	53	52	57	425	409	368	429	130	93	74	72	......	......	......	......	434	372	345	386	177	183	149	172	611	555	494	558
Junior	78	58	62	57	506	450	421	399	160	138	104	85	......	......	......	......	536	450	382	355	208	196	205	186	744	646	587	541
Sophomore	83	97	66	67	589	592	518	502	219	194	158	149	......	......	......	......	596	627	503	465	295	256	239	253	891	883	742	718
Freshman	82	97	131	90	626	677	658	581	267	251	234	216	......	......	......	......	677	698	701	601	298	327	322	286	975	1025	1023	887
Special	4	15	10	8	47	60	62	68	20	17	13	10	......	......	......	......	40	52	43	40	31	40	42	46	71	92	85	86
Graduates	......	......	......	......	......	......	......	......	......	......	......	......	192	203	221	195	151	165	164	161	41	38	57	34	192	203	221	195
Total-regular curriculums	303	320	321	279	2193	2188	2027	1979	796	693	583	532	192	203	221	195	2434	2364	2138	2008	1050	1040	1014	997	3484	3404	3152	2985
Non-degree curriculums																												
2nd year	27	29	35	27	......	......	......	......	......	......	......	......	......	......	......	......	27	26	33	25	......	3	2	2	27	29	35	27
1st year	39	37	47	50	......	......	......	......	......	......	......	......	......	......	......	......	38	36	42	46	1	1	5	4	39	37	47	50
Total	66	66	82	77	......	......	......	......	......	......	......	......	......	......	......	......	65	62	75	71	1	4	7	6	66	66	82	77
Summer School	......	......	......	......	......	......	......	......	......	......	......	......	732	732	746	713	386	386	402	409	346	346	344	304	732	732	746	713
Extension courses	......	......	......	......	......	......	......	......	......	......	......	......	774	643	521	775	528	409	292	504	246	234	229	271	774	643	521	775
General Electric	......	......	......	......	......	......	......	......	......	......	......	......	34	33	39	42	34	33	39	42	......	......	......	......	34	33	39	42
Total-short curriculums	66	66	82	77	......	......	......	......	......	......	......	......	1540	1408	1306	1530	948	890	808	1026	592	584	580	581	1540	1474	1388	1607
Grand Total	369	386	403	356	2193	2188	2027	1979	796	693	583	532	1732	1611	1527	1725	3447	3254	2946	3034	1643	1624	1594	1558	5090	4878	4540	4592
Less Duplicates	......	......	......	......	......	......	......	......	......	......	......	......	224	206	210	278	174	148	158	255	50	58	52	23	224	206	210	278
NET GROSS TOTAL	369	386	403	356	2193	2188	2027	1979	796	693	583	532	1508	1405	1317	1447	3273	3106	2788	2779	1593	1566	1542	1535	4866	4672	4330	4314

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